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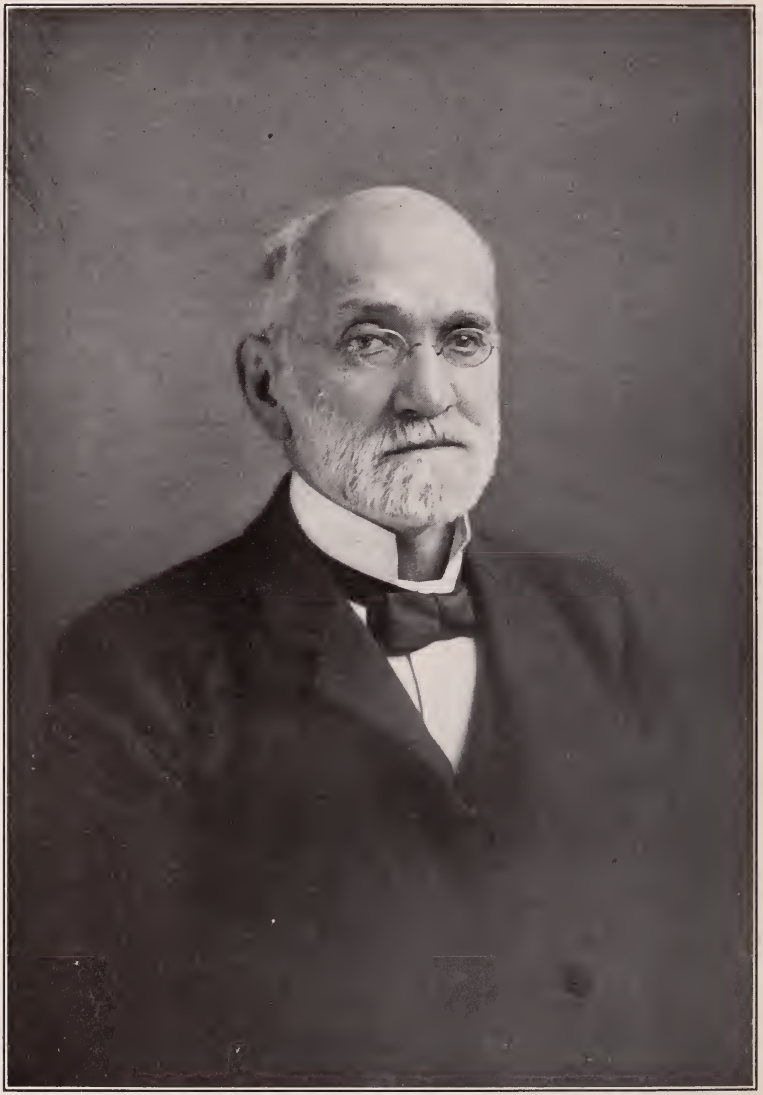

THOMAS SNOWDEN WIEGAND.

Born November 9, 1825. Died August 10, 1909. Was a member of the American Pharmaceutical Association for 52 years, having joined in 1857.

WILLIAM JOHN MACLESTER GORDON.

Born in Somerset County, Md., December 25, 1825. Died at Mt. Airy, Cincinnati, O., July 7, 1909 Was a member of the American Pharmaceutical Association for 55 years, having joined in 1854. Served as Recording Secretary, 1855–1859; as First Vice-President, 1860–1862; as President, 1864–1865; as Vice-Chairman of the Council, 1881–1883.

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PROCEEDINGS

OF THE

AMERICAN

PHARMACEUTICAL ASSOCIATION

AT THE

FIFTY-SEVENTH ANNUAL MEETING

HELD AT

LOS ANGELES, CAL., AUGUST, 1909.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

BALTIMORE:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1909.

INITIAL MEETING AT NEW YORK 1851.
AMERICAN
PHARMACEUTICAL
ASSOCIATION
INCORPORATED AT
WASHINGTON, D.C.
FEB'Y 21.
1888.
ORGANIZED AT PHILADELPHIA-1852.

OFFICERS OF THE ASSOCIATION.

1909-1910.

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REPORTER ON THE PROGRESS OF PHARMACY.

C. LEWIS DIEHL . . . . . Louisville, Ky.

EDITOR OF THE BULLETIN.

C. S. N. HALLBERG . . . . . Chicago, Ill.

LOCAL SECRETARY.

T. ASHBY MILLER. . . . . Richmond, Va.

OFFICERS-ELECT FOR 1910–1911.

In accordance with the requirements of Chapter I of the By-Laws, an election for four officers of the Association and three members of the Council, for the year 1910–1911, was held by mail during the months of September and October, 1909, and as shown by the report of the Board of Canvassers, hereto attached, the following candidates have received a plurality of the votes cast and are therefore declared elected, the installation to take place at the next annual meeting at Richmond, Va., in May, 1910:

President—EUGENE G. EBERLE, of Dallas, Tex.

First Vice-President—WM. B. DAY, of Chicago, Ill.

Second Vice-President—OTTO F. CLAUS, of St. Louis, Mo.

Third Vice-President—LEONARD A. SELTZER, of Detroit, Mich.

Members of the Council—JAMES H. BEAL, of Scio, O.; JOS. P. REMINGTON, of Philadelphia, Pa.; HENRY H. RUSBY, of Newark, N. J.

CHAS. CASPARI, JR., *General Secretary.*

BALTIMORE, *November* 24, 1909.

REPORT OF THE BOARD OF CANVASSERS.

ST. LOUIS, MO., *Nov.* 22, 1909.

CHARLES CASPARI, JR., *General Secretary.*

The Board of Canvassers, appointed by President H. H. Rusby, to examine and count the ballots cast for officers and members of the Council, for 1910–11, begs leave to state that it has fulfilled its duties and submits the following report: The total number of valid votes cast was 1071. In all but a very few instances the preference of the voter was clearly indicated. The following summary shows the result of the ballots counted:

For President	E. G. Eberle	received	676 votes
	Chas. M. Ford	"	170 "
	John G. Godding	"	224 "
For First Vice-President	Wm. B. Day	"	609 "
	Foress B. Lillie	"	356 "
	Chas. L. Wright	"	98 "
For Second Vice-President	Ernest Berger	"	407 "
	Otto F. Claus	"	418 "
	Jno. M. A. Laue	"	232 "
For Third Vice-President	Edw. L. Baldwin	"	319 "
	Wm. R. Dickinson	"	287 "
	Leonard A. Seltzer	"	448 "
Members of Council	Jas. H. Beal	"	553 "
	Edw. Kremers	"	290 "
	Jos. L. Lemberger	"	207 "
	Wm. Mittelbach	"	169 "
	Geo. F. Payne	"	245 "
	Jos. P. Remington	"	733 "
	Henry H. Rusby	"	414 "
	Lucius E. Sayre	"	211 "
	Martin I. Wilbert	"	322 "

CHARLES E. CASPARI, *Secretary,*
FRANCIS HEMM,
JAMES M. GOOD, *Chairman.*

COUNCIL.

MEMBERS OF THE COUNCIL.

Term Expires.		
1910.	The Officers of the Association,	*Ex-officio.*
"	The Chairmen of the Five Sections,	
"	The Secretary of the Council,	
"	Leo Eliel	South Bend, Ind.
"	F. W. Meissner	La Porte, Ind.
"	Fabius C. Godbold	New Orleans, La.
"	Elie H. La Pierre	Boston Branch A. Ph. A.
1911.	Henry P. Hynson	Baltimore, Md.
"	S. A. D. Sheppard	Boston, Mass.
"	Murray G. Motter	Washington Branch A. Ph. A.
"	Julius A. Koch	Pittsburg Branch A. Ph. A.
"	Lewis C. Hopp	Northern Ohio Branch A. Ph. A.
"	Alfred W. Clark	Denver Branch A. Ph. A.
"	Philip Asher	New Orleans Branch A. Ph. A.
1912.	Oscar Oldberg	Chicago, Ill.
"	Chas. E. Caspari	St. Louis, Mo.
"	George M. Beringer	Camden, N. J.
"	Ambrose Hunsberger	Philadelphia Branch A. Ph. A.
"	John B. Thomas	Baltimore Branch A. Ph. A.
"	George H. Hitchcock	New York Branch A. Ph. A.
"	Frederick J. Wulling	Northwestern Branch A. Ph. A.
"	Chas. A. Storer	Chicago Branch A. Ph. A.

OFFICERS OF THE COUNCIL.

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Joseph W. England, Secretary.

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C. S. N. Hallberg,
F. W. Meissner, Jr.,
Lewis. C. Hopp,
Chas. W. Johnson,
Chas. E. Caspari,
J. W. England, *Secretary*.
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On Publication:

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M. I. Wilbert,
Leo Eliel.

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(Appointed by the President.)

E. L. Patch (for 1 year).
Geo. M. Beringer (for 2 years).
C. S. N. Hallberg (for 3 years).
Chas. E. Caspari (for 4 years).
A. B. Lyons (for 5 years).
Wm. Mittelbach (for 6 years).
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L. D. Havenhill (for 8 years).
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(Elected by the Council.)

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FOR THE TERM OF ONE YEAR.

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JOHN M. FRANCIS, Detroit, Mich.

FOR THE TERM OF TWO YEARS.

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FOR THE TERM OF THREE YEARS.

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WM. A. PUCKNER, Chicago, Ill.

FOR THE TERM OF FOUR YEARS.

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GEO. D. ROSENGARTEN, Philadelphia, Pa.
M. I. WILBERT, Washington, D. C.

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(Appointed by the Council.)

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MILTON H. HICKOX, Dallas, Tex.

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ALTERNATES.

J. W. ENGLAND, Philadelphia, Pa.
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WM. J. SCHIEFFELIN, New York, N. Y.
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A. B. LYONS, Detroit, Mich.
S. L. BRESLER, Denver, Colo.

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa....	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	*Samuel M. Colcord*, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853..	Boston, Mass.....	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.....	*William B. Chapman*, Gincinnati.	*Henry T. Cummings*, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855..	New York, N. Y....	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.....	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	*Frederick Stearns*, Detroit, Mich.	*Henry T. Kiersted*, New York.
Sept. 8, 1857..	Philadelphia, Pa....	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C...	*John L. Kidwell*, Georgetown, D. C.	*Edward R. Squibb*, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.....	*Samuel M. Colcord*, Boston.	*William Procter, Jr.* Philadelphia.	*Joseph Roberts*, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y....	*Henry T. Kiersted*, New York.	*William J. M. Gordon*, Cincinnati.	*William S. Thompson*, Baltimore.	*Theodore Metcalf*, Boston.
Aug. 27, 1862..	Philadelphia, Pa....	*Wm. Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L Massot*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863..	Baltimore, Md.....	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	*Chas. A. Tufts*, Dover, N. H.	*George W. Weyman*, Pittsburg.
Sept. 21, 1864..	Cincinnati, O.....	*William J. M. Gordon*, Cincinnati.	*Richard H. Stabler*, Alexandria.	Enno Sander. St. Louis.	*Thomas Hollis*, Boston.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865..	Boston, Mass.....	*Henry W. Lincoln*, Boston.	*George C. Close*, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O	*Charles A. Heinitsh*, Lancaster, Pa.
Aug. 22, 1866..	Detroit, Mich.....	*Frederick Stearns*, Detroit, Mich.	*Edward Parrish*, Philadelphia.	*Ezekiel H. Sargent*, Chicago.	*John W. Shedden*, New York.
Sept. 10, 1867..	New York, N. Y....	*John Milhau*, New York.	*Robert J. Brown*, Leavenworth, Kan.	*N. Hynson Jennings*, Baltimore.	*Daniel Henchman*, Boston.
Sept. 8, 1868..	Philadelphia, Pa....	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	*Albert E. Ebert*, Chicago.
Sept. 7, 1869..	Chicago, Ill.....	*Ezekiel H. Sargent*, Chicago.	*Ferdinand W. Sennewald*, St. Louis.	*John H. Pope*, New Orleans.	*Joel S. Orne*, Cambridgeport, Mass.
Sept. 13, 1870..	Baltimore, Md.....	*Richard H. Stabler*, Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871..	St. Louis, Mo.....	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	*George F. H. Markoe*, Boston.	*Matthew F. Ash*, Jackson, Miss.
Sept. 3, 1872..	Cleveland, O.	*Albert E. Ebert*, Chicago.	*Samuel S. Garrigues*, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	*Henry C. Gaylord*, Cleveland, O.
Sept. 16, 1873..	Richmond, Va.....	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	*Paul Balluff*, New York.
Sept. 8, 1874..	Louisville, Ky.....	C. Lewis Diehl, Louisville, Ky.	*Joseph Roberts*, Baltimore.	William T. Wenzell, San Francisco.	*Augustus R. Bayley*, Cambridgeport, Mass.
Sept. 7, 1875..	Boston, Mass.....	*George F. H. Markoe*, Boston.	*Frederick Hoffmann*, New York.	*T. Roberts Baker*, Richmond, Va.	*Christian F. G. Meyer*, St. Louis.
Sept. 12, 1876..	Philadelphia, Pa....	*Charles Bullock*, Philadelphia.	Samuel A. D. Sheppard, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	*Jacob D. Wells*, Cincinnati.
Sept. 4, 1877..	Toronto, Can.....	William Saunders, London, Ont.	Ewen McIntyre, New York.	*John Ingalls*, Macon, Ga.	*Emlen Painter*, San Francisco.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878..	Atlanta, Ga.....	*Gustavus J. Luhn*, Charleston, S. C.	*Frederick T. Whiting*, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879..	Indianapolis, Ind...	*George W. Sloan*, Indianapolis, Ind.	*T. Roberts Baker*, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880..	Saratoga, N. Y.	*James T. Shinn*, Philadelphia.	George H. Schafer, Fort Madison, Ia.	*William S. Thompson*, Washington, D. C.	*William Simpson*, Raleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo....	*P. Wendover Bedford*, New York.	*Emlen Painter*, San Francisco.	George Leis, Lawrence, Kan.	*John F. Judge*, Cincinnati.
Sept. 12, 1882..	Niagara Falls, N. Y.	*Charles A. Heinitsh*, Lancaster, Pa.	*John Ingalls*, Macon, Ga.	Louis Dohme, Baltimore,	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883..	Washington, D. C...	*William S. Thompson*, Washington, D. C.	*Charles Rice*, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884..	Milwaukee, Wis....	*John Ingalls*, Macon, Ga.	*John A. Dadd*, Milwaukee, Wis.	*Henry Canning*, Boston.	*Charles F. Goodman*, Omaha, Neb.
Sept. 8, 1885..	Pittsburg, Pa.....	*Joseph Roberts*, Baltimore.	Albert H. Hollister, Madison, Wis.	*Albert B. Prescott*, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886..	Providence, R. I....	*Chas. A. Tufts*, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	*M. W. Alexander*, St. Louis.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.....	John U. Lloyd, Cincinnati.	*M. W. Alexander*, St. Louis.	A. K. Finlay, New Orleans.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich.....	*M. W. Alexander*, St. Louis.	Jas. Vernor, Detroit, Mich.	*Fred. Wilcox*, Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889..	San Francisco, Cal..	*Emlen Painter*, New York.	Karl Simmon, St. Paul, Minn.	*Wm. M. Searby*, San Francisco.	Jos. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890..	Old Pt. Comfort, Va.	*A. B. Taylor*, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore.	Jas. M. Good, St. Louis.

LIST OF OFFICERS (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
April 27, 1891..	New Orleans, La....	A. K. Finlay, New Orleans.	*Geo. J. Seabury*, New York.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	*Sidney P. Watson*, Atlanta, Ga.	*Wm. H. Averill*, Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill.....	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore.
Sept. 3, 1894..	Asheville, N. C.....	*William Simpson*, Raleigh, N. C.	Chas. M. Fo d, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montreal, Can.
Aug. 14, 1895..	Denver, Colo.....	James M. Good, St. Louis.	Chas. E. Dohme, Baltimore.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896..	Montreal, Can.....	Joseph E. Morrison, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897..	Lake Minnetonka, Minn.....	*Henry M. Whitney*, Lawrence, Mass.	George C. Bartells, Camp Point, Ill.	*Wm. S. Thompson*, Washington, D. C.	*Jacob A. Miller*, Harrisburg, Pa.
Aug. 29, 1898..	Baltimore, Md.....	Charles E. Dohme, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899..	Put-in-Bay, O.....	*Albert B. Prescott*, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900..	Richmond, Va.....	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901..	St. Louis, Mo.....	Henry M. Whelpley, St. Louis.	*Wm. M. Searby*, San Francisco.	George F. Payne, Atlanta, Ga.	*Wm. S. Thompson*, Washington, D. C.
Sept. 8, 1902..	Philadelphia, Pa....	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Tex.	Henry Willis, Quebec, Can.
Aug. 3, 1903..	Mackinac Island, Mich.....	Lewis C. Hopp, Cleveland, O.	Wm. C. Alpers, New York, N. Y.	Albert M. Roehrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.

LIST OF OFFICERS (Concluded.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1904..	Kansas City, Mo....	James H. Beal, Scio, O.	Philip C. Candidus, Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburg, Pa.
Sept. 4, 1905..	Atlantic City, N. J..	Jos. L. Lemberger, Lebanon, Pa.	Chas. Holzhauer, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.
Sept. 3, 1906..	Indianapolis, Ind...	Leo Eliel, South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	C. S. N. Hallberg, Chicago, Ill.	Thomas P. Cook, New York, N. Y.
Sept. 2, 1907..	New York, N. Y....	*Wm. M. Searby*, San Francisco, Cal.	Oscar Oldberg, Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908 ..	Hot Springs, Ark ..	Oscar Oldberg, Chicago, Ill.	Eugene G. Eberle, Dallas, Tex.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909..	Los Angeles, Cal. ..	Henry H. Rusby, Newark, N. J.,	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.

HONORARY PRESIDENTS.

Philip C. Candidus, Mobile, Ala., 1907–08.

Samuel A. D. Sheppard, Boston, Mass., 1908–09.

Enno Sander, St. Louis, Mo., 1909–1910.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.

Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, Md., 1863–65.

Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–1908.
Henry M. Whelpley, St. Louis, 1908–1910.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.

William J. M. Gordon, Cincinnati, 1855–59.
Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.

Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.

CORRESPONDING SECRETARIES.

William Procter, Jr., 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–1854.

Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.

Peter W. Bedford, New York, 1860–62, and 1863–65.
John M. Maisch, Philadelphia, 1862–63.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865–Sept., 1893.

Henry M. Whelpley, St. Louis (acting), August, 1893.

Joseph P. Remington, Philadelphia, 1893–94.
Chas. Caspari Jr., Baltimore, 1894–96.

GENERAL SECRETARY.

Chas. Caspari Jr., Baltimore, 1896 1910.

LOCAL SECRETARIES.

For the meeting held in	
1867	*P. Wendover Bedford.*
1868	*Alfred B. Taylor.*
1869	*Henry W. Fuller.*
1870	*J. Faris Moore.*
1871	*William H. Crawford.*
1872	*Henry C. Gaylord.*
1873	Thomas H. Hazard.
1874	*Emil Scheffer.*
1875	Samuel A. D. Sheppard.
1876	Adolphus W. Miller.
1877	Henry J. Rose.
1878	*Jesse W. Rankin.*
1879	*Eli Lilly.*
1880	Charles F. Fish.
1881	William T. Ford.
1882	*Hiram E. Griffith.*
1883	Charles Becker.
1884	Henry C. Schranck.
1885	*George A. Kelly.*
1886	*William B. Blanding.*
1887	*George W. Voss.*
1888	James Vernor.
1889	Edward W. Runyon.
1890	Charles E. Dohme.
1891	A. K. Finlay.
1892	*H. M. Whitney.*
1893	Henry Biroth.
1894	W. G. Smith.
1895	Edm. L. Scholtz.
1896	Joseph E. Morrison.
1897	Edw. Shumpik.
1898	Henry P. Hynson.
1899	Lewis C. Hopp.
1900	T. Ashby Miller.
1901	H. M. Whelpley.
1902	Wm. L. Cliffe.
1903	F. W. R. Perry.
1904	Joseph C. Wirthman.
1905	Wm. C. Wescott.
1906	Frank H. Carter.
1907	Thos. P. Cook.
1908	Martin A. Eisele.
1909	Thos. W. Jones.
1910	T. Ashby Miller.

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–91, and 1895–1910.

Chas. Rice, New York, N. Y., 1891–92.

Henry Kraemer, Philadelphia, Pa., 1892–95.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	Chairman.	*Vice-Chairman.*	*Secretary.*
1880–81	Jos. P. Remington.	*Joseph Roberts.*	*Geo. W. Kenneay.*
1881–82	" "	*Wm. J. M. Gordon.*	" "
1882–83	" "	" "	" "
1883–84	" "	C. Lewis Diehl.	" "
1884–85	" "	*John A. Dadd.*	" "
1885–86	" "	C. Lewis Diehl.	" "
1886–87	*Wm. S. Thompson.*	*H. J. Menninger.*	" "
1887–88	Wm. H. Rogers.	Karl Simmon.	" "
1888–89	Jas. M. Good.	*Emlen Painter.*	" "
1889–90	" "	*Wm. S. Thompson.*	" "
1890–91	" "	" "	" "
1891–92	" "	" "	" "
1892–93	" "	*H. M. Whitney.*	" "
1893–94	" "	" "	" "
1894–95	*Wm. S. Thompson.*	" "	" "
1895–96	" "	Wm. C. Alpers.	" "
1896–97	" "	Jas. M. Good.	" "
1897–98	" "	" "	" "
1898–99	" "	" "	" "
1899–00	" "	" "	" "
1900–01	" "	" "	" "
1901–02	*A. B. Prescott.*	Chas. E. Dohme.	" "
1902–03	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903–04	" "	Leo Eliel.	" "
1904–05	" "	Jos. L. Lemberger.	" "
1905–06	" "	Wm. C. Alpers.	" "
1906–07	" "	Albert M. Roehrig.	" "
1907–08	" "	" "	" "
1908–09	Jos. P. Remington.	*Wm. M. Searby.*	Jos. W. England.
1909–10	Fabius C. Godbold.	Julius A. Koch.	" "

PAST AND PRESENT OFFICERS OF THE SECTIONS.

Section on Commercial Interests.

	Chairman.	*Secretary.*
1887–88	A. H. Hollister.	*J. W. Colcord.*
1888–89	" "	" "
1889–90	Leo Eliel.	F. B. Kilmer.
1890–91	*Henry Canning.*	W. L. Dewoody.
1891–92	W. H. Torbert.	Arthur Bassett.
1892–93	" "	" "
1893–94	Wiley Rogers.	Jas. O. Burge.
1894–95	*Geo. J. Seabury.*	" "
1895–96	" "	Clay W. Holmes.
1896–97	Lewis C. Hopp.	E. D'Avignon.
1897–98	Joseph Jacobs.	Jas. H. Bobbitt.
1898–99	" "	" "
1899–00	Jas. M. Good.	Chas. A. Rapelye.
1900–01	Chas. A. Rapelye.	F. W. Meissner.
1901–02	F. W. Meissner.	E. G. Eberle.
1902–03	Thos. V. Wooten.	Wm. C. Anderson.
1903–04	Wm. L. Dewoody.	Robert C. Reilly.
1904–05	Chas. R. Sherman.	" "
1905–06	Henry P. Hynson.	Herman D. Kniseley.
1906–07	Herman D. Kniseley.	Chas. H. Avery.
1907–08	Jacob Diner.	George O. Young.
1908–09	Harry B. Mason.	Erich H. Ladish.
1909–10	Waldo M. Bowman.	G. H. P. Lichthardt.

Section on Pharmaceutical Education.

	Chairman.	*Secretary.*
1887–88	*John F. Judge.*	H. M. Whelpley.
1888–89	*P. W. Bedford.*	L. E. Sayre.

Section on Scientific Papers.

	Chairman.	*Secretary.*
1887–88	*T. Roberts Baker.*	A. B. Lyons.
1888–89	*Emlen Painter.*	H. M. Whelpley.
1889–90	H. M. Whelpley.	C. F. Dare.
1890–91	E. L. Patch.	C. S. N. Hallberg.
1891–92	C. S. N. Hallberg.	H. W. Snow.
1892–93	C. T. P. Fennel.	F. G. Ryan.
1893–94	L. E. Sayre.	C. M. Ford.
1894–95	A. R. L. Dohme.	Geo. B. Kauffman.
1895–96	S. P. Sadtler.	W. C. Alpers.
1896–97	W. C. Alpers.	V. Coblentz.
1897–98	Edward Kremers.	A. B. Lyons.
1898–99	Henry H. Rusby.	H. V. Arny.
1899–00	Frank G. Ryan.	Caswell A. Mayo.
1900–01	Oscar Oldberg.	Lyman F. Kebler.
1901–02	Lyman F. Kebler.	Jos. W. England.
1902–03	J. O. Schlotterbeck.	" "
1903–04	Wm. A. Puckner.	Eustace H. Gane.
1904–05	Eustace H. Gane.	Chas. E. Caspari.
1905–06	Chas. E. Caspari.	Daniel Base.
1906–07	Reid Hunt.	Virgil Coblentz.
1907–08	Virgil Coblentz.	Chas. E. Vanderkleed.
1908–09	Chas. E. Vanderkleed.	Martin I. Wilbert.
1909–10	Martin I. Wilbert.	Albert H. Clark.

Section on Pharmaceutical Legislation.

	Chairman.	*Secretary.*
1887–88	R. F. Bryant.	W. P. De Forest.
1888–89	C. W. Day.	J. N. Hurty.

Section on Pharmaceutical Education and Legislation.

	Chairman.	*Secretary.*
1889–90	*P. W. Bedford.*	A. B. Stevens.
1890–91	Wm. Simon.	L. C. Hogan.
1891–92	A. B. Stevens.	" "
1892–93	R. G. Eccles.	" "
1893–94	" "	" "
1894–95	Jas. M. Good.	C. S. N. Hallberg.
1895–96	C. S. N. Hallberg.	Jas. H. Beal.
1896–97	" "	" "
1897–98	Jas. H. Beal.	H. Gordon Webster.
1898–99	A. B. Lyons.	C. B. Lowe.
1899–00	C. B. Lowe.	J. A. Koch.
1900–01	" "	" "
1901–02	E. G. Eberle.	J. W. T. Knox.
1902–03	J. W. T. Knox.	Harry B. Mason.
1903–04	Harry B. Mason.	Wm. L. Cliffe.
1904–05	" "	" "
1905–06	Oscar Oldberg.	Jos. W. England.
1906–07	" "	" "
1907–08	Jos. W. England.	Chas. H. LaWall.
1908–09	" "	" "
1909–10	Chas. H. LaWall.	Chas. W. Johnson.

Section on Practical Pharmacy and Dispensing.

	Chairman.	*Secretary.*
1900–01	Henry P. Hynson	F. W. E. Stedem.
1901–02	F. W. E. Stedem.	Wm. Kaemmerer.
1902–03	Geo. M. Beringer.	*Wm. H. Burke.*
1903–04	*Wm. H. Burke.*	E. A. Ruddiman.
1904–05	Chas. A. Rapelye.	Wm. C. Kirchgessner.
1905–06	Wm. C. Alpers.	H. A. Brown Dunning.
1906–07	H. A. Brown Dunning.	Joseph Weinstein.
1907–08	Franklin M. Apple.	" "
1908–09	Leonard A. Seltzer	E. Fullerton Cook.
1909–10	Otto Raubenheimer.	Erich H. Ladish.

Section on Historical Pharmacy.

	Chairman.	*Secretary.*
1904–05	*Albert E. Ebert.*	Caswell A. Mayo.
1905–06	John F. Hancock.	C. S. N. Hallberg.
1906–07	Ewen McIntyre.	Eugene G. Eberle.
1907–08	Edward V. Howell.	" "
1908–09	John B. Bond.	" "
1909–10	Eugene G. Eberle.	John A. Dunn.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are four permanent Funds at the present time (July 1, 1909), three of which are invested in Massachusetts State bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and, after consideration, adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (See Proceedings 1870, pp. 87–96), and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV., Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modi-

fied (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52), again in 1896 (Proceedings, page 17), and again in 1906 (Proceedings, page 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is ninety-eight, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884 (p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of $4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. By vote of the Association, the name of this fund was changed to the William Procter Jr. Fund on September 15, 1902 (see Proceedings 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings 1906, p. 100). The report of the Chairman of the Council on the invested funds of the Association, published on page 453 of the present volume, shows that on July 1st, 1909, the value of the Life Membership Fund was $16,604.90 (face value of securities only given), *of which sum the interest for any current year only may be used by the Association for its expenses.*

THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882 to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblentz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred. B.

Power; for 1905, to Dr. Ernst Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred. B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; and for 1909, to Henry Kraemer.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On July 1st, 1909 (Proceedings, p. 453), its reported value was $979.38 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526–528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Robt. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of $1107.81 ($525 + $582.81) had increased in 1883 to $1232.76. Since 1887 the securities in which the fund is invested are specified in the reports of the Chairman of the Council; the reported value was $2329.67 (face value of securities only given) on July 1, 1909 (see Proceedings, p. 453). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE ENDOWMENT FUND.

At the fifty-fourth annual meeting, held at Indianapolis, Ind , September. 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proc. 1906, p. 99), under the following conditions:

"That the said S. A. D. Sheppard and J. H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand dollars ($25,000).

"That as moneys shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations,

together with the amount of the principal, shall reach the sum of twenty-five thousand dollars ($25,000).

"That when the Endowment Fund shall have reached the sum of twenty-five thousand dollars ($25,000) one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand dollars ($50,000), the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt of obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc. 1907, pp. 47 and 48; Proc. 1908, pp. 476 and 477; Proc. 1909, p. 464); according to the Treasurer's report, the total amount contributed up to July 1, 1909, was $3,477.00.

THE GENERAL FUND.

On February 26, 1909, the Council directed that $5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc. 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five $1,000.00 St. Louis, Mo., 4 per cent. bonds at 103⅝ and accrued interest. These bonds are registered in the name of the Treasurer of the American Pharmaceutical Association.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Procter, Jr., if possible in 1817, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc. 1906, p. 63; Proc. 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the Wm. Procter, Jr., Monument Fund, be turned over to the Treasurer of the A. Ph. A., to be deposited on interest for the benefit of said fund (see Proc. 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908–1909, reports having received on January 27, 1909, the sum of $3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. per annum (see Proc. 1909, p. 472).

THE MOTTER FUND.

The Association holds this fund in trust for the National College of Pharmacy, Department of Pharmacy of George Washington University, at the request of Murray Galt Motter (see Proc. 1907, p. 54). The Treasurer, in his annual report for 1908–1909, states that no draft has been made against this account since it was opened August 4, 1905. The amount of the fund, including interest, is $27.58.

ABSTRACT OF THE PROCEEDINGS OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY, HELD AT LOS ANGELES, AUG. 16, 17, 1909.

The first session was called to order by President Lillie, Monday morning, at 9 o'clock a. m., in the Alexandria Hotel.

Mr. Chas. B. Whilden extended the greetings of the State of California as a representative of the California State Board of Pharmacy. In his remarks Mr. Whilden said: "As our guests, we extend to you a true California greeting. From snow-clad Shasta to the shell-strewn strands of Coronado, and from the sun-kissed Sierras to the placid Pacific, every city, town and hamlet, bids you welcome." His very appropriate address was responded to by Mr. Chas. W. Tobey of Ohio on behalf of the visiting delegates.

The Association then proceeded to business, and a roll call showed the following States represented:

Arkansas—Dr. Jno. B. Bond, Sr., J. F. Dowdy, W. L. Dewoody.
Arizona—Fred Fleishman.
Colorado—S. L. Bresler.
Florida—E. Berger.
Indiana—A. F. Sala, Theo. E. Otto.
Idaho—I. M. Starrh.
Louisiana—F. C. Godbold.
Maryland—Jno. A. Davis.
Massachusetts—E. O. Engstrom, F. A. Hubbard.
Michigan—J. D. Muir, W. S. Collins.
New Mexico—E. J. Murphy.
New York—H. L. Taylor.
North Dakota—W. S. Parker, H. L. Haussamen.
Oregon—Geo. C. Blakeley.
Ohio—Charles W. Tobey.
Oklahoma—F. B. Lillie, J. C. Burton.
Texas—R. H. Walker.
Vermont—W. E. Terrill.
Virginia—James L. Avis.

President Lillie in his address made the following recommendations:

First: That the Committee on Questions and Methods prepare and present to each State Board a complete set of examination questions with methods and rules for conducting the examination, including practical work. That each State Board be requested to use the work at their first examination and to report to the chairman of the committee as to its usefulness and practicability with any comments or criticisms the Board may have to offer.

Second: That this committee prepare and furnish to each State Board at the earliest possible time the following:

1. The subject to be used in examination and number of questions.
2. The time to be given to each subject.
3. Practical work: of what it shall consist and time to be given same.
4. Preliminary qualifications and how tested.

(a) As to education. (b) As to practical experience.

Third: I recommend that a standing Legislative Committee be created whose duty it shall be to report annually any state laws that in the interest of Pharmacy should be amended or changed and that the Association take active steps to correct all bad legislation and to assist all States in procuring legislation in the interest of progressive pharmacy.

Fourth: I recommend that a publicity committee of one person be appointed to report for the Bulletin any matter that may be of general or special interest to the State Boards with the view of establishing a department in the Bulletin that will be of general interest and information to State Boards.

Fifth: In order that the work our Association does should have proper dissemination and produce the results intended, the Executive Committee should have the authority to have an abstract of the proceedings published containing all matter that is of importance to keep before the various State Boards, and that this abstract, in convenient pocket form, be mailed to each Board member at least twice during the year.

Sixth: I recommend that this Association set a date in the not far distant future, when all State Boards of Pharmacy affiliated with this Association shall require of candidates for Registered Pharmacist: 1st, that they have five years of practical experience; 2nd, that they have a high school education or its equivalent; 3rd, that they hold a diploma from some school of Pharmacy recommended by the National Syllabus Committee; 4th, that they pass a satisfactory examination before a State Board of Pharmacy.

I also recommend that all State Boards arrange for the granting of certificates of qualified assistants and that candidates for registration shall remain qualified assistants until the above requirements have been fully set.

The Association's action on these as recommended in the committee report on the President's recommendation was as follows:

On Nos. 1 and 2: That the Committee on Questions and Methods prepare and present to any of the State Boards, upon request, a complete set of examination questions, including practical work, and that such Boards report to the Chairman of the Committee any criticisms they may have to offer as to the usefulness and practicability of the questions.

On No. 3: That a Legislative Committee be created as recommended.

On Nos. 4 and 5: That a committee of one be appointed to look after the publication of any matter of interest to the Boards of Pharmacy, same to be published in the A. Ph. A. Bulletin, if possible.

On No. 6: That all Pharmacy Boards arrange, if possible, for the granting of certificates of qualified assistant pharmacists, and that they also endeavor to advance the educational requirements of all applicants for registration, so that eventually the equivalent of a college education will be demanded.

On No. 7: That the Constitution be amended to allow the recognition of contiguous State organizations as auxiliary to the National Association of Boards of Pharmacy.

A general report of existing laws and methods of administration from the various States represented by Board members consumed a large portion of the time of the convention. It was very instructive and brought out much information. This discussion is printed in full in the published report which is in the hands of each Board member, and should be carefully read by them.

The officers elected for the year are as follows:

John D. Muir, Grand Rapids, Mich., President.

W. S. Parker, Lisbon, N. D., 1st Vice-President.

D. F. Davis, Barre, Vt., 2nd Vice-President.

T. M. Starrh, Shoshone, Idaho, 3rd Vice-President.

A. F. Sala, Winchester, Indiana, Secretary-Treasurer.

R. H. Walker, Gonzales, Texas, Member of Executive Committee.

The report of the Syllabus Committee and the address of Dr. Taylor, of New York, on the Syllabus as a basis or measure for the educational qualification of a pharmacist showed the progress of our work in the establishment of uniformity in requirements for registration, and we were promised the complete report at our next meeting.

ABSTRACT OF THE PROCEEDINGS OF THE TENTH ANNUAL MEETING OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

In the absence of the President and Vice-President, Professor Julius A. Koch, Chairman of the Executive Committee, called the meeting to order.

Prof. Charles Caspari, Jr., was elected to preside, and in the absence of the Secretary-Treasurer, Prof. E. G. Eberle was elected to act in that office.

The following named schools and colleges were represented:

Baylor University College of Pharmacy,
California College of Pharmacy,
Maryland College of Pharmacy,
Massachusetts College of Pharmacy,
New Orleans College of Pharmacy,
New York College of Pharmacy,
Ohio State University College of Pharmacy,
Pittsburgh College of Pharmacy,
Philadelphia College of Pharmacy,
St. Louis College of Pharmacy,
University of Kansas, School of Pharmacy,
University of Washington, School of Pharmacy,
University of Illinois, School of Pharmacy.

The President in his address made the following recommendations:

1st. The conversion of the Conference into an actual association of schools of pharmacy on a broad and possible basis, whereby a large majority of the existing schools may become members, and that the members be such as will accept the reasonable control of the organization.

2nd. The abolishment of the present plan of admitting new members, especially the five-year and the property requirements. The admission of schools upon the joint recommendation of the local state pharmaceutical association and the board of pharmacy of the state in which the school applying is located.

3rd. The conversion of the Conference into a body exclusively of authorized representatives of schools, one from each member, and each member to be required, under penalty, to have a delegate present at each meeting. This, of course, suggests that the delegate's expenses would be paid by the institution. Under such conditions a three-fourths vote would be quite possible and desirable.

4th. The alteration of the by-laws whereby the President, Vice-President and the Secretary-Treasurer will be constituted the Executive Committee.

5th. The continued close connection with the American Pharmaceutical Association; the publication of the Conference proceedings as a part of the A. Ph. A. proceedings, and the recognition of the A. Ph. A. Bulletin as the official organ of the Conference.

6th. Forming, by every possible means that is creditable, and becoming a closer and more co-operative union with the National Association of Boards of Pharmacy, with most respectful deference to its views and recommendations.

Action upon recommendations 1 and 2 was deferred until the next annual meeting.

Recommendations 3 and 4 were not approved.

Recommendation 5 was adopted.

Recommendation 6 was amended to read as follows:

"The American Conference of Pharmaceutical Faculties desires to co-operate in every movement with the National Association of Boards of Pharmacy, that will tend to elevate the profession of pharmacy."

In the amended form it was adopted.

The report of the Secretary-Treasurer was submitted, showing a balance on hand of $270.93.

The report of the Executive Committee was presented by Prof. J. A. Koch, the Chairman of the Committee, and is as follows:

To the American Conference of Pharmaceutical Faculties:

In accordance with instructions received from the Conference at its last meeting, the Chairman of the Executive Committee submitted the question of the admission of the following colleges to a supplementary mail vote, resulting in the election of the same to membership in the Conference:

University College of Medicine, Department of Pharmacy, Richmond, Va.

Baylor University, College of Pharmacy, Dallas, Texas.

Medico-Chirurgical College, Department of Pharmacy, Philadelphia, Pa.

South Dakota State College of Agriculture and Mechanical Arts, Department of Pharmacy, Brookings, S. D.

The total membership is now 33.

During the year numerous inquiries regarding the admission to the Conference, but no new applications for membership have been received.

The By-Laws now make it the duty of the Executive Committee to collect and tabulate data regarding the entrance requirement, curriculum, and the qualifications of the teaching force, and the educational facilities of all the schools of pharmacy in the United States, and to report thereon at the annual meeting of the Conference, submitting a list of such schools as appear to be eligible for membership and report any shortcomings on the part of schools holding membership in the Conference.

The committee has entered upon this task and has accumulated considerable data, but in view of the enormous amount of work connected with the investigation, feels itself unable to make any definite report at present, other than a report of progress. This portion of the committee work has consisted, up to the present time, only of the collection of material, pending the time when this material can be classified and tabulated, the greater its amount the greater the apparent confusion.

The committee had hoped to be in a position to perform part of this classification in advance of the present report, but of this the state of the work does not admit and another year must be allowed to bring in a report in presentable form.

Although the present committee has no complaint to offer regarding the labor involved in carrying out the instruction of the Conference above referred to, it feels called upon to express the opinion that the proper performance of the work of the Executive Committee, as now constituted, and certain to increase steadily in the future, is more than should be expected of it, without the employment of a paid clerical assistant.

The committee recommends the appointment of a special committee by the Conference, to investigate and report at our next meeting the necessity and practicability of the employment of such paid assistant or officer.

This committee should inform itself of the extent of the work now devolving, and likely to devolve, on the Executive Committee, the probable cost of such assistance, including both salary and expenses, and ascertain the readiness of the members of the Conference to bear the cost assessed upon them.

It is the opinion of your committee that through the services of such paid officer of the Conference it could become possible to enter upon some new form of membership, greatly desired by many of our most able members, but hitherto deemed impracticable, largely because of the labor needed in its administration.

[Signed] H. H. Rusby,
C. W. Johnson,
J. A. Koch, *Chairman.*

The report of the Syllabus Committee was made by Professor J. H. Beal. The discussion which followed was participated in by Dr. Henry Taylor, of New York State Education Department.

The report of the delegates to the meeting of the National Association of Retail Druggists was presented by Prof. Joseph Remington, who in concluding suggested that the practice of appointing a delegate to this body be continued.

The following officers were elected:

President—William M. Searby.

Vice-President—E. H. LaPierre.

Secretary-Treasurer—Geo. C. Diekman.

Executive Committee—Julius A. Koch (*Chairman*), E. G. Eberle, Freeman P. Stroup.

The following papers were read and discussed:

"The Locality Educutional Proviso," by Prof. J. T. McGill.

"The Accredited High School," by Prof. Philip Asher.

A paper entitled "The Past, Present, Future and Limitations of the Conference," by Prof. H. E. Kalusowski, was presented, and was referred to the joint meeting of the Faculties with the Boards for discussion.

REPORT

ON THE

PROGRESS OF PHARMACY.

FROM JULY 1, 1908, TO JUNE 30, 1909.

By C. LEWIS DIEHL.

No more convincing testimony on the progress and favorable evolution of American Pharmacy can be brought forward than the work that has been accomplished in the local branches of this Association during the past year. Not only has a pronouncedly increased interest been manifested in the monthly meetings of these branches, but with few exceptions these meetings have been held with great regularity, from month to month, during the season of 1908–1909—beginning with October or November and ending with the May meeting. Moreover, encouraged by the admirable work done by the existing branches, a formidable number of new local branches has been organized since last year's meeting and others are in contemplation and will doubtless be organized in the near future—the newly organized branches consisting of those of Denver, Indiana, New Orleans, Pittsburg and Washington City: and if we add a local branch which is said to have been organized by the election of officers in St. Louis, the number of branches will have nearly doubled, being thirteen in all.

Believing that the synopsis of the proceedings of the local branches prepared for last year's report has been favorably received and is generally appreciated, this innovation is here continued in this report and may well become a permanent feature which will serve well in lieu of a formal introductory.

Proceedings of the Local Branches of the American Pharmaceutical Association.

(season 1908–1909.)

Baltimore Branch.

December, 1908.—The first meeting since May was held on the third of the month. H. A. B. Dunning spoke interestingly of the work of the National Formulary Committee at Hot Springs. J. J. Barnett read a paper in which he pointed out some defects of the *N. F. Granular powders.* In the discussion following Dr. Charles Caspari, Jr., explained that these formulas were included in the N. F., so that the pharmacist could make these preparations extemporaneously, and that, in the "powder form," they kept some time without darkening. He also called attention to the general directions for granulating them, if desired. Dr. Caspari also briefly called attention to defects and their remedies in certain other N. F. preparations: *Elixir of glycerophosphates* requires an increase from 8 to 10 Gm. in the amount of phosphoric acid per liter, which was found to correct the tendency to precipitate. The tendency of *Elixir quinine and phosphates* to become turbid is overcome by increasing the amount of water to 200 Cc. and decreasing the aromatic elixir correspondingly. *Compound resorcin ointment* is satisfactorily made in accordance with the recent suggestion of a member of the Chicago Branch, using white wax in place of paraffin and part anhydrous and hydrous wool-fat. It gradually darkens however. J. Carlton Wolf finds the amount of sugar too large in *Aromatic syrup of senna.* He recommends that the sugar be reduced to 550 Gm. per liter and that 475 Cc. of percolate be collected instead of 375 Cc.

January, 1909.—The program of this meeting held on the 21st of the month, was a discussion of the first thirty formulas appearing in the National Formulary, the criticisms brought out in the discussion to be forwarded to the Revision Committee. This discussion proved very interesting, so much so that all the formulas given were not reached. The value of this program was generally commented on and the work will very likely be continued. At the annual election held at this meeting, H. P. Hynson was elected President; E. F. Kelly, Secretary-Treasurer.

February, 1909.—At this meeting, held on the 25th of the month, the study of National Formulary preparations was continued, the discussions being confined to *Elixirs* and resulting in the following suggestions: that elixirs should be kept on hand for some time after manufacture to allow more complete blending, and that a caution to this effect should appear in the National Formulary. That the alcoholic percentage should be decreased, glycerin being used where necessary, that more flavoring material

was prescribed than would dissolve, or resulting in a too highly flavored product.

March, 1909.—At this meeting, held on the 18th of the month, Mr. Mr. P I. Heuisler very entertainingly described "*How Some of the 49 Blue Bottles are Made.*" Mr. H. A. B. Dunning gave his experience with "*U. S. P., N. F., and Other Emulsions,*" in which particular attention is directed to the instability of some of the emulsions (see *Emulsa*, under "Pharmacy"). It was the sense of the meeting that no official emulsion of cod-liver oil, castor oil, or petroleum, should be kept for more than four days before use.

April, 1909.—The following resolution was presented at the meeting, held on the 15th of the month, for discussion at a future meeting of the Branch and for discussion at the coming meeting of the Maryland Pharmaceutical Association, by Henry P. Hynson:

Resolved, That it is the sense of the Baltimore Branch of the American Pharmaceutical Association, that the Ninth Revision of the U. S. Pharmacopœia should not contain formulas for compound preparations, and should present matter relating to simples and preparations of simples, only; that the National Formulary should contain only such formulas for compound preparations as are consistent with prevailing advanced knowledge of chemistry, pharmacology, pharmacy and therapeutics, and that all the titles therein contained should be true to content and in accord with accepted medical and pharmaceutical ethics. It is further

Resolved, That the parent body be requested to consider the advisability of publishing a General Receipt Book, with frequent supplements to contain all formulas dropped from the U. S. P. and N. F., and such other formulas as may be useful to pharmacists.

Chicago Branch.

October, 1908.—The first meeting of the season 1908–1909 was held on the 20th of the month. Mr. George P. Mills gave a talk on U. S. P. and N. F. Propaganda and incidentally gave a formula for "*Glycerite of Heroin Comp.*" (which see under "Pharmacy"), and called attention to some improvements in the formula for "*Elixir of Iron, Quinine and Strychnine,*" consisting: 1. In acidifying the elixir before mixing with alcoholic solution of the alkaloids; 2. In dissolving the iron phosphate without heat; and 3. In replacing the acetic acid with one-half amount of lactic acid. Professor Hallberg reported for the Committee on Medical Relations, referring to the fact that there are still seven district medical societies to which the "Declaration on the Prescription" (see Proceedings, 1908, 11) had not as yet been presented, but that it was proposed to reach these medical societies during the coming winter. The remaining session was largely devoted to a discussion of programs for the winter's meeting. The desirability of the two national Pharmaceutical Associations holding their meetings annually at the same place and practically at the same time was emphasized by the adoption of a preamble and resolution introduced by Mr. Wooten.

November, 1908.—The principal topic discussed at the meeting which was held on the 17th of the month concerned the advertisement of fraudulent medicines by the principal newspapers of Chicago. It developed that while the Chairman of the Committee on Publicity (Mr. Wooten) had in the main received but little encouragement, notable exceptions were the Chicago Tribune and some other newspapers which had refused patent-medicine advertising amounting in the aggregate to large sums. By invitation, C. Lewis Diehl delivered an address on "The Evolution of the National Formulary," and Dr. Hill made some felicitous remarks on the more cordial relations between pharmacists and physicians by comparison with his experience some twelve years ago while Chairman of the Section on Pharmacology and Therapeutics of the A. M. A. The doctors had drifted away, following "false gods," and had been exploited by the detail men and he hoped that the present entente would result in greater interest on the part of physician in drug therapeutics.

December, 1909.—The subject for discussion at this meeting, held on the 15th of the month, was "The Pharmacopœia." President Oldberg delivered an address on the subject of "The Revision and Scope of the Pharmacopœia," which elicited an animated discussion in which Mr. Puckner, Mr. Meissner, Mr. Hallberg, and others participated. Mr. Puckner was called upon to speak on "Alkaloidal Assay Processes," in the course of which he stated that some were worded in the Pharmacopœia in a way that would lead one to suppose that they were intended for a novice, while others assumed the highest degree of skill in order to carry out the process. He suggested that a plan might be followed of giving reference in the Pharmacopœia to where a complete outline of the process could be found. Mr. Day spoke on the subject of "Organic Drugs" and referred also to the failure of the Pharmacopœia to conform in "Botanical Nomenclature" to the usages of the botanical societies.

January, 1909.—The discussion at this meeting, held on the 26th of the month, was opened by J. H. Wells on the legal aspects of the proposed amendment to the "Pharmacy Law" which would require graduation from a recognized college as prerequisite for registration, the subject of registration of apprentices coming also into consideration. As a result of the discussion the branch adopted a resolution advising that a certain amount of discretion be given the Board of Pharmacy in admitting those who while not graduates in pharmacy could satisfy the Board that they had an education fully equivalent to the standard school of pharmacy course; also, that the registration of apprentices be discontinued. A second topic of discussion was "The Proposed Pure Drug Law of Illinois," which elicited some interesting remarks from Dr. Andrew Winton, Director of the United States Food and Drug Laboratory, Dr. Thomas J. Bryan, of the Illinois Food Commission, and others. Dr. Bryan brought out strongly the fact that all goods should be labeled, bearing the name and

address of the originator of the package, and while this is not necessary in case of the Federal Law where the bill of lading in itself constitutes a label, yet under state legislation it is very important in order to fix the responsibility and secure the necessary evidence. At this meeting President Oscar Oldberg and Secretary W. B. Day were re-elected to their respective offices.

February, 1909.—The fifth monthly meeting of this season was held on the 16th of the month. The subject of discussion at this meeting was "The Revision of the Pharmacopœia," which consumed the entire evening. A paper by Professor Gordin on "Tests for Chemical Products; How May they be Improved?" was received with marked attention and elicited an animated discussion. A paper on "The Extractive Preparations—How May the Formulas be Simplified?" (which see under "Pharmacy") was read by Prof. C. M. Snow, in which he advocates the adoption of general formulas for the different classes of galenical preparations, and points out the advantages which would be derived from such statements.

March, 1909.—As per previous resolution the principal subject for discussion at this meeting, which was held on the 16th of the month, was "The Revision of the National Formulary." Mr. Hallberg briefly outlined the work of some of the sub committees on N. F. regarding formulas that should be dropped, formulas that should be admitted and formulas that should be improved, also flavoring and coloring. President Oldberg called attention to the desirability that both the Pharmacopœia and the Formulary be revised in such a way as to give the pharmacist a chance to make his own preparations with no other trouble and no more apparatus than is absolutely necessary. Otto E. Bruder read a paper embodying suggestions for the improvement of the N. F. comprising among other features information as to preservation, desirable additions defining articles used in making the preparations, and preparations which should be dismissed. The question of flavors also elicited some discussion, and the formulas for a number of preparations—compound syrup of white pine, essence of pepsin, syrup of rhubarb and potassium, etc.—were criticized by different members. Among other criticism, Mr. Boehm suggested that the use of fluidextracts in making elixirs, etc., should be avoided when practicable and the drug itself employed instead.

April, 1909.—At this meeting, held on the 20th of the month, the discussion on "The National Formulary" was continued. Mr. Hallberg read a list of preparations that have been proposed for admission, including general formulas for sterile solutions, insufflations, sprays, and various dosage formulas. The question of "Nomenclature" also elicited an animated discussion. "It is believed that the nomenclature of the N. F. should be based on no absolutely hard and fast lines, that is, should be more flexible than that of the U. S. P., in which the latter should adhere

as closely as possible to scientific terminology as well as orthography." A number of preparations were criticized in the course of the evening, among them: Liq. ammoniæ anisatus, liq. alumin. acetatis, cataplasma kaolini, comp. syrup of hypophosphites, milk of bismuth, and essence of pepsin.

May, 1909.—This meeting, held on the 21st of the month, was exceptional in that it was held in connection with a dinner tendered the Trustees of the U. S. P. C. and other visitors present at "The Ebert Memorial Dedication." The regular business was therefore postponed until the next meeting.

Denver Branch.

January, 1909.—The organization of this Branch was effected on the 28th of the month by the adoption of the constitution and by-laws and the election of officers. S. L. Bresler was elected President; F. W. Nitardy, Secretary.

February, 1909.—At this meeting, held on the 11th of the month, it was decided to donate to the Denver and Gross Medical College a line of samples of U. S. P. and N. F. preparations.

Indiana Branch.

June, 1909.—The organization of this Branch was effected on the 16th of the month by the adoption of the constitution and by-laws and the election of officers. Minor T. Waddell was elected President; Frank H. Carter, Secretary. The Branch starts out with thirty-one members, and is hopeful that this number will increase and that good work will be done on pharmaceutical lines.

New England Branch.

January, 1909.—This, the annual meeting, was held on the 13th of the month. The subjects considered were the advisability of holding monthly meetings, and the methods of making the meetings interesting to a larger number. It was voted that monthly meetings be held for the next four months, and that they be held on the same day that the Boston Association of Retail Druggists meets. C. H. Packard was elected President; R. Albro Newton, Secretary-Treasurer.

February, 1909.—The meeting was held on the 17th of the month. The matter of suggesting changes in the forthcoming revision of the N. F. was referred to a committee, who will ascertain from pharmacists in New England what changes seem advisable to them. Papers were read by Dr. H. H. Smith, on "The Manufacture, Mode of Administration and Theory of Action of Antitoxines and Vaccines," and Leon A. Thompson, "On the Pharmacopœial Tables." Mr. Thompson's subject seemed timely in view of the present confusion of systems, and because many pharmacists do not take advantage of that part of the Pharmacopœia.

March, 1909.—The meeting of the Branch was held on the 10th of the month. A paper was read by Chas. F. Nixon on the "Official Syrups," in which he critically reviewed the manufacture according to the U. S. P. directions. Frank Ernst spoke of "Time-Saving Devices in the Retail Store." E. H. La Pierre exhibited three different forms of receptacles for "Lime Water," all designed to exclude carbon dioxide.

April, 1909.—The meeting was held on the 14th of the month. A paper on "Native Wines" was read by August Thiel, in which he exhaustively described the manufacture of wines, from the grape to the finished product. In his opinion, pharmacists now need not purchase imported wines in order to obtain the finest flavors for pharmaceutical preparations. Other preparations criticized and discussed were: "Elixir Gentian Glycerinated"; "Petroleum Emulsion"; "Compound Solution of Sodium Phosphate."

New Orleans Branch.

February, 1909.—Eighteen members of the A. Ph. A. met on the 19th of the month and organized a Branch in accordance with the rules of the Association. F. C. Godbold was elected President; A. G. Guidry, Secretary-Treasurer. Discussion followed and plans were made for the future of the Branch.

March, 1909.—No record of this meeting is available.

April, 1909.—The third monthly meeting of the branch was held on the 19th of the month. At the previous meeting it was agreed that each member of the branch would bring samples of "Elixir Ferri, Quininae et Strychninae Phosphatum, U. S. P.," and "Liquor Anticepticus Alkalinus, N. F.," and many samples of each were offered at this meeting for comparison. The alkaline antiseptic solutions were found practically uniform in color and odor, and the formula was agreed to be entirely satisfactory. The samples of elixir of iron, quinine and strychnine phosphates, on the other hand, varied in color from a light amber to a dark brown. One sample, however, was characterized by a very light green color, and was a very sightly preparation; but this differed from the official preparation by the substitution of quinine muriate and strychnine sulphate for the alkaloids, and ammonium chloride for the water of ammonia, directed in the U. S. P. formula. As custom has taught the physicians to look for a *green elixir*, some of the members contended that it would be better to modify this elixir as so to give it the color desired.

May, 1909.—No record of this meeting is available.

June, 1909.—The fifth monthly meeting was held on the 21st of the month. Mr. R. L. Villere made a short talk on "Essential Oils." Mr. A. J. Guidry spoke interestingly of "Galenicals Containing Wines as a Menstruum." In his opinion, evidently wine is of little utility as a menstruum, except as a flavor, which can be replaced by other aromatics.

Mr. Philip Asher mentions that he has unsuccessfully tried the addition of 2 per cent. formalin to retard oxidation of "Comp. Resorcin Ointment."

New York Branch.

October, 1908.—The first monthly meeting of the season, 1908–1909, was held on the 12th of the month. Otto Raubenheimer, Chairman of the Committee on Professional Relations, reported the approval of the "Declaration of the Status of the Prescription" (see Proceedings, 1908, 14) by several local medical and pharmacal organizations. Reports from delegations to several associations were received and discussed. Mr. T. D. McElhenie presented an appreciative criticism of the Harrison formulas for the preparation of proteid iron (see Bulletin A. Ph. A., May, 1908, 136–138), and exhibited specimens of "Solution of Peptonate of Iron with Manganese," and of the various other preparations suggested by Mr. Harrison, as well as certain modifications of the same. Mr. Raubenheimer, exhibiting copies of the Austrian, French and Swiss Pharmacopœias, gave a talk on these Pharmacopœias, as also on the new Pharmacopœias of Spain, Russia, Holland, Japan and Denmark, concluding that the U. S. P., VIII, stands at the head of the list for practical and scientific purposes.

November, 1908.—The meeting of the Branch was held on the 9th of the month. Progress was reported by the chairmen of various committees. "The Liniments of the National Formulary" were favorably criticized in a paper read by Mr. O. Raubenheimer. In this connection he mentioned Dunning's formula for "Camphorated Soap Liniment" (see Proceedings, 1907, 130) as being a decided improvement on the U. S. P. formula. Dr. G. C. Diekman read a paper on "Oleate of Mercury" and exhibited eleven specimens of this preparation, with the object of showing the necessity of an accurate description of oleate of mercury being embodied in the Pharmacopœia. The paper elicited an animated discussion, and the suggestions made by Dr. Diekman were on motion referred to the attention of the Pharmacopœial Committee of Revision.

December, 1908.—The meeting of the Branch was held on the 14th of the month. Satisfactory progress was reported by the committees "On Professional Relations," "On Education and Legislation," and "On Science and Practice of Pharmacy." Chairman Hitchcock, of the "Propaganda Committee," reported that both the president-elect and the secretary of the New York County Medical Society heartily approved the suggestion that another meeting of physicians and pharmacists be held under the auspices of the society and the local branch. After a general discussion of propaganda work, which was participated in by several physicians, Mr. C. A. Mayo gave a very interesting talk on "The Dispensing of Sterile Solutions in Ampullas" (which see under "Pharmacy"); Mr. Mayo demonstrating the complete process of filling ampullas, from the

sterilization of the empty bulb to the testing of the completeness of the sealing of the tube. During the discussion following, Dr. Diekman raised the question as to the sterility of solutions dispensed in ampullas, and thought this should be investigated thoroughly; while on motion of Mr. O. Raubenheimer, it was resolved that the practicability of embodying a chapter on "Sterilization" in the next revision of the U. S. P. be taken into consideration by the Committee of Revision. Mr. Raubenheimer also read a paper entitled "Official Preparations versus Nostrums: a Reply to the Charge of Piracy," in which he presented a comprehensive study of the history of a number of formulas which at the present time are simulated in official and proprietary preparations.

January, 1909.—The second annual meeting of the Branch was held on the 11th of the month. Chairman Diekman, of the "Committee on the Science and Practice of Pharmacy," stated that he was planning to invite the students in the various Schools of Pharmacy in the metropolitan section to an early meeting of the Branch, and suggested that the members review the various recent foreign Pharmacopœias and present papers comparing them with the U. S. P., for the assistance of the Committee of Revision. The report of the Chairman of the "Committee on Professional Relations," Mr. Otto Raubenheimer, was a comprehensive review of the work toward a better relation of physicians and pharmacists done by the Branch during the year. This included the adoption of the Declaration of the Status of the Prescription (see Bulletin A. Ph. A., Sept., 1908, 284), and the joint meeting held with the New York County Medical Society, one praiseworthy result of which was the adding of a course in official pharmacy to the curriculum of the Bellevue Medical College. Mr. T. P. Cook, chairman of the "Committee on Education and Legislation," presented a report adversely to the "Mann Bill" and offered a resolution to this effect, which was unanimously adopted without discussion. A very instructive paper entitled "Chemical Changes in Dispensing, Causing Complaint," was presented by Mr. J. L. Lascoff, which gave rise to an animated discussion during which the members generally related their experience with complaints due to incompatibilities and unavoidable chemical changes to which many substances are subject. At this meeting Jacob Diner was elected President of the Branch: Hugh Craig, Secretary.

February, 1909.—The meeting was held on the 8th of the month. The Committee on Education and Legislation reported adversely on the "Gluck Bill," a proposed State measure requiring the publication of the formula upon the label of proprietary medicines and the filing of such formulas with the State Commissioner of Health, and the committee was instructed to oppose the enactment of the bill. Mr. G. H. Hitchcock read a preamble and resolutions having to do with the duty of the American Pharmaceutical Association in the matter of the recently closed suit against G. M. Beringer, of Camden, N. J., and in explanation Dr. H. H.

Rusby gave a brief synopsis of the matter leading up to the Beringer case itself. He expressed his support of the resolutions as a matter of justice, Mr. Beringer having acted in behalf of the retail pharmacists at the request of the Association, which had approved his action. He also moved to amend the resolutions as offered with the view to making them more definite. This amendment was adopted and the resolutions as amended were passed (see Bulletin A. Ph. A., March, 1909, 83–84). Resolutions commending Dr. Harvey W. Wiley for his efforts in behalf of the enactment of the Food and Drugs Act of June 30, 1906, and for the enforcement thereof, thereby conferring great benefits upon the general public and the business interests of the country, were presented from the executive board of the branch and unanimously passed. Mr. Otto Raubenheimer presented his translation of a paper by Dr. Hermann Schelenz, of Cassel, Germany, entitled "The History of the Medicinal Earths and of Cataplasm of Kaolin," which gave rise to considerable discussion, in which Dr. A. Herzfeld and Dr. G. C. Diekman took opposing sides, Dr. Herzfeld deprecating the introduction into the Pharmacopœia of a preparation on the score of its reputation as a proprietary medicament, whilst Dr. Diekman took the ground that the action of the Revision Committee was solely prompted by the real or supposed merit of the preparation.

March, 1909.—At the meeting held on the 8th of the month, Mr. G. A. Ferguson and Mr. Otto Raubenheimer introduced the matter of the exhibit of official preparations to be arranged by the Philadelphia Branch at the 1909 meeting of the A. M. A., for which individual contributions were solicited. The proposition from Mr. H. P. Hynson, of the Baltimore Branch, to hold a meeting of the several eastern branches of the A. Ph. A. at Atlantic City during the meeting of the A. M. A., was also taken into consideration, but without arriving at a definite conclusion. For the Propaganda Committee, Chairman G. H. Hitchcock reported satisfactory progress toward the completion of the plans for the meeting to be held conjointly with the Medical Society of the County of New York sometime late in April. The commercial side of pharmacy was featured in the program of the evening, Chairman Mayo, of the Committee on Commercial Interests, introducing Mr. Thomas, who demonstrated and described coin-operated cigar-vending attachments for show cases. "Business Methods in the Drug-Store" was the title of a paper presented by Dr. Julius Jungmann, the discussions following being in accord with the title of this paper.

April, 1909.—By previous resolution the special topics for discussion at this meeting, which was held on the 12th of the month, were preparations and Pharmacopœias, the report of Dr. G. C. Diekman of the Committee on Pharmacy, including abstracts of the following articles: "Extracts containing Glucosides," by Rosenthaler and Meyer; "The Value of Compressed Tablets," by Blaschnek; "Benzoic Acid as a Preservative," by

Lehmann; and "Pil. Ferri Carbonici Blaudii," by Serger. The effort to attract students to this particular meeting was evidently a failure. The principal event of the meeting was the presentation of the features of the essential leading foreign Pharmacopœias: The Austrian (by Otto Raubenheimer); the British (by H. G. Lehmann) the French and the Mexican (by C. A. Mayo); the German (by W. C. Alpers); the Japanese (by Kiezo Woozenaka); the Russian (by Joseph Weinstein); the Spanish (by Hugh Craig); and the Swiss (by J. L. Mayer). A very pleasant feature was added to the program of the evening when Professor J. P. Remington exhibited the first copy of the Spanish translation of the United States Pharmacopœia.

May, 1909.—At this meeting, which was held on the 10th of the month, the principal event was an address by Professor Virgil Coblentz on "The Chemical Work of the Revision of the Pharmacopœia," in the course of which he gave some idea of the tremendous amount of work necessary in the revision, and of the many things which must be taken into consideration in determining each step in that work. Following the discussion engendered by this address there was some little discussion of the proposal originating in the Baltimore Branch relative to the advisability of eliminating all formulas for preparations from the Pharmacopœia. The prevailing opinion indicated that such a step, however desirable, is not now expedient.

June, 1909.—At this meeting, held on the 14th of the month, a brief but comprehensive report of the meeting of the American Medical Association and the subsequent gathering of pharmacists and physicians at Atlantic City, was made by Mr. Otto Raubenheimer. Dr. G. C. Diekman, reporting for the Committee on Pharmacy, gave an abstract of the following articles: "The Standardization of Digitalis Leaves," by Focke, and "The Preparation of a Permanent Liquor Aluminii Acetatis," by Gruening. Brief reference was also made to "Identifying Physostigmine," "Strychnine in Monobromated Camphor," and "The Estimation of Hg. in Preparation of Mercury." Mr. Frederick E. Niece presented a paper entitled "The Pharmacist—The Future Clinical Chemist," and at the conclusion of his paper demonstrated various chemical operations, such as urea, albumin, and sugar determinations, connected with clinical work.

Northern Ohio Branch.

November, 1908.—The first meeting of the season 1908–1909 was held on the 17th of the month, and was largely devoted to a discussion of a program for the work of the coming winter. A paper on "Tragacanth" (which see under "Materia Medica") was read by Professor Joseph Feil, from which it appeared that only a few samples of powdered drug responded to the pharmacopœial requirement of forming a jelly with 50 parts of water, and that it is most likely largely adulterated with "Sarco-

colla," a Persian gum supposedly from a species of *Astragalus* other than those yielding tragacanth.

March, 1909.—The meetings of the Branch were resumed by the session held on the 18th of the month. After an impromptu discussion of pharmaceuticals and preparations by various members, Professor Joseph Feil read the paper of the evening on "Oil of Lemon," outlining the commercial varieties, the characters and tests of identity, etc. He surmises that the odor of fine oil is due to resins. Professor H. V. Arny demonstrated the work done so far on "Color Standards" for the National Formulary. At this meeting Lewis C. Hopp was elected President; H. V. Arny, Secretary-Treasurer.

Northwestern Branch.

October, 1908.—The first of the 1908–1909 series of meetings of this Branch was held jointly with the Hennepin County Medical Society on the 19th of the month. Interesting addresses were made by Dr. F. A. Knights, president of the Medical Society, and by Dean Wulling, president of the local Branch, the latter selecting as his text "The Council of Pharmacy and Chemistry of the A. M. A." Congratulating the physicians and pharmacists of America on having such an institution as this Council, he referred to efforts being made by certain leading pharmacists some years ago toward the establishment of a central bureau and laboratory similar to the one now conducted by the Council, and illustrated graphically how the work of the Council of Pharmacy and Chemistry was benefiting both physicians and pharmacists. In the course of this address a number of interesting topics were developed for subsequent discussion, which was participated in by the members of both professions present. Mr. McCall in a ten-minute paper covered the subjects of patent medicines and counter-prescribing, which also elicited an animated discussion.

April, 1909.—This meeting of the Branch was held at Duluth on the 23d of the month, and was attended by members of the St. Louis County Medical Society as invited guests. Dean Wulling delivered the address of the evening, in which he reviewed "The Pharmacy of the Past Fifty Years." Dr. Ecklund read a paper on "Medical and Pharmaceutical Ethics," and Dr. Weston spoke of the recent movement called "Therapeutic Nihilism," declaring that treatment of disease by drugs would never be wholly superseded. These furnished topics for quite an animated discussion, in which the physicians present engaged preponderatingly. An informal discussion of the unreliability of many of the ready preparations, such as tablets, pills, etc., closed the meeting, which adjourned at a late hour.

Philadelphia Branch.

October, 1908.—The first meeting of the series 1908–1909 was held on the 6th of the month. The evening was devoted to a discussion of "The

Recent Meeting of the American Pharmaceutical Association." Plans for making a comprehensive display of U. S. P. and N. F. preparations at the coming convention of the American Medical Association were discussed, and a committee was appointed to take charge of the matter.

November, 1908.—The meeting was held on the 3d of the month. Professor J. P. Remington read a paper on "Local Option and Prohibition—Their Effect on the Retail Drug Business," and after an active discussion, in which a number of members took part, a resolution was adopted, "that it is the sense of this meeting that there should be added to the pharmacy laws of Pennsylvania a provision to read: The Board of Pharmacy may suspend or revoke the license of any pharmacist who is convicted of violating any portion of the pharmacy laws of Pennsylvania." The subject of "Compounding and Dispensing" was interestingly discussed both in the practical and legal aspects—the latter being elucidated by Mr. Allen C. Thomas, of the Philadelphia Bar. Attention having been called to the work recently undertaken in the Hygienic Laboratory of the Public Health and Marine Hospital Service of the United States, a resolution was adopted thanking Surgeon General Wyman for his promised co-operation through the assistance of the Hygienic Laboratory in perfecting the Pharmacopœia, and assuring him of the hearty support and sympathy of the Branch in the elaboration of the work then undertaken.

December, 1908.—The stated meeting, which was held on the 1st of the month, was devoted mainly to the consideration of "The Use and Value of Pure Food and Drug Laws." The subject was discussed at some length by Mr. Charles H. LaWall, Mr. W. L. Cliffe and Mr. Clement S. Brinton, chief of the Food Inspection Laboratory at Philadelphia. The question of restricting and controlling the sale of cocaine and other habit-forming drugs was brought up by the Committee on Amendments to the Pharmacy Laws of Pennsylvania, and a resolution was adopted urging the passage of a State law compelling the registration of all sales of cocaine, eucaine, their salts, or synthetic substitutes, by manufacturers, jobbers, wholesale or retail druggists or vendors, such records to be at all times open to inspection.

A special meeting, held on the 16th of the month, was devoted to the second of a series of free lectures and demonstrations arranged by the Branch for the "Post-Graduate Course of Instruction for Local Pharmacists." The lecturer, Professor George Meeker, expressed the opinion that the manufacture of pharmaceuticals is more and more drifting into the hands of the large manufacturing houses. This indicates that the retail pharmacist can dismiss from his mind the idea of becoming a factor of any importance in the manufacture of pharmaceuticals; instead, he must equip himself in such a manner that he may readily determine whether the products he handles are properly prepared. He must familiarize himself with modern laboratory methods and equip himself

with apparatus necessary to carry out the tests for identity and purity of the U. S. P. The establishment of a laboratory for analysis and research is a long step in the direction of proper relationship with the medical practitioner, in that the pharmacist is the logical individual to do the clinical laboratory work for the physician. According to a plan proposed by the lecturer, competent pharmacists would be given the title of "Certified Clinical Chemist" by a board of examiners representing the A. Ph. A. and A. M. A. The character of work demanded was interestingly described and practically demonstrated during the lecture by Professor Meeker's assistants, who gave detailed explanations of the intricate analytical processes involved.

January, 1909.—The regular meeting of the Branch was held on the 5th of the month. Reports were received and discussed from the following committees: "Amendments to the Pennsylvania State Pharmacy Laws"; "On Exhibition at the A. M. A. Convention;" and "On Establishing Pharmaceutical Chemical Sections in the Local Branches." A resolution, endorsing the vigorous enforcement of the Food and Drug Law by Dr. Harvey Wiley and his assistants, and expressing the opposition of the Branch to the removal of Dr. Wiley, was introduced by Mr. John K. Thum and unanimously adopted. The special business of the evening was then opened by Mr. Chas. H. La Wall with an interesting paper on "Comparative Results in Alkaloidal Assay." Mr. L. Henry Bernegau read a paper on "Some Laboratory Notes on Assay Work"; Professor Chas. E. Vanderkleed read a paper on the "Determination of Alcohol in Galenical Preparations"; and Mr. John G. Roberts read a paper entitled "Practical Suggestions for the Improvement of U. S. P. Assay Methods." These papers, which are produced in abstract in the Bulletin A. Ph. A. of March, 1909, 78–81, supplied the topics for discussion which was participated in by a number of the members present.

At a special meeting of the Branch, held on the 19th of the month, the third of the series of free lectures and demonstrations for the post-graduate instruction of local pharmacists was delivered by Dr. E. D. Reed, his subject being the "Problems of Pharmacodynamics, Methods of Pharmacodynamic Research, and the Assay of Drugs by Physiologic Methods." The lecture was illustrated with numerous lantern slides, which clearly portrayed the method of determining drug-action upon nerve, muscle, etc.

February, 1909.—The regular stated meeting of the Branch was held on the 2d of the month. Reports received and considered were as follows: "On Pharmacy Laws," "On Exhibit at the A. M. A. Convention," and "On Pharmaceutical Chemical Sections." It was recommended that the latter be known as the Scientific Section of the Local Branch, and it is believed that such a section, as outlined in the report, will add much to the strength of the Branch without in any way interfering with its general work. The following papers were read during the evening and elicited

animated discussion: "The Efficiency and Sufficiency of the U. S. P. and N. F. Preparations for the General Practitioner," by Dr. J. M. Anders; "The Limitations of Prescriptions," by Mr. Franklin M. Apple; "Past, Present and Future of the Propaganda," by Chris. Koch, Jr.; and the "Declaration on the Prescription," by Professor I. V. S. Stanislaus. The latter was accompanied by a resolution approving the "Declaration" adopted by the Chicago Branch last year (see Bulletin A. Ph. A., Sept., 1908, 284), but it was suggested that still further improvements might be made, and the matter was therefore referred back to a special committee.

March, 1909.—The regular meeting of the Branch was held on the 2nd of the month. An amendment to the By-Laws providing for a Scientific Section of the Branch was adopted at this meeting and the Secretary was instructed to call a meeting for the purpose of organizing this section. The scientific program of the evening being taken up, the following papers were presented and discussed by the members present: "Alpha and Beta Ionones," by Prof. S. P. Sadtler; "Some Recent Work on the Chemistry of Volatile Oils," by Prof. I. V. S. Stanislaus; "Preliminary Methods for Determining the Purity of Volatile Oils," by Dr. G. L. Pancoast and Mr. W. A. Pearson; and on "The Use of the Centrifuge in Assaying Volatile Oils," by Prof. Frank X. Moerk. The annual election being held, Henry C. Blair was elected President; Ambrose Hunsberger, Secretary-Treasurer.

At a special meeting of the Branch held on the 6th of this month, the fifth of the series of Free Lectures and Demonstrations in the Post-Graduate Course of Instruction was delivered by Professor H. Evert Kendig, his topic being "Assay Processes, Their Uses and Practical Value." The Doctor's complete grasp of his subject, delivered in a clear, concise fashion, in language generally free from technicalities, was thoroughly appreciated by the large body of retail druggists, students, and teachers who were present.

The organization of the Scientific Section of the Philadelphia Branch was effected at a special meeting held on March 11th, Mr. J. L. Turner being elected Chairman, and Mr. W. A. Pearson, Secretary.

April, 1909.—The meeting of the Branch, held on the 6th of the month, was notable because the topics for discussion were introduced by a delegation from the Washington City Branch, composed of Messrs. Hoover, Motter and Kebler. Visitors from the Baltimore and New York Branch were also present at this meeting. Dr. Lyman F. Kebler, Chief of the Drug Division, read a paper on "Some Work of the Drug Division of the Bureau of Chemistry," in which he portrayed the indefatigable efforts of his department in the United States government in running down the many fake medicines that are constantly being exploited to and foisted upon the long-suffering and unsuspecting public. Dr. Murray Galt Motter read a paper on "The Organization Work of the Hygienic Laboratory,"

tracing the history of the Marine Hospital Service from the time of its inception to its present-day organization, and the further development of the bureau to facilitate the study of pharmacology, bacteriology, pathology, zoölogy, etc. Mr. Geo. W. Hoover, Chief of the Drug Inspection Laboratory, read a paper on "Supervising the Importation of Drugs," in which he described the salutary effect of the Food and Drugs act upon both imported and domestic products used for food and medicine. The discussion on these several papers was entered into by many of the members present, among whom may be mentioned the following visitors: M. I. Wilbert, H. P. Hynson, Dr. Beates, Mr. Raubenheimer, Mr. Diner. The report of the Committee on the Declaration on the Prescription was on motion of Prof. Remington, Chairman, referred to the American Pharmaceutical Association.

The first regular meeting of the Scientific Section was held on April 8, the following papers being presented and discussed: "Mechanical Indicator for Judging the End Reaction When Estimating Sugar with Fehling's Solution," by I. V. S. Stanislaus; "Some Suggestions in the Examination of Medicinal Chemicals," by H. B. Meade; and "Is Formaldehyde Developed when Solutions of Cane Sugar are Boiled?" by Chas. H. La Wall.

The last of the series of Post-Graduate Lectures under the auspices of the Branch, was delivered on the 20th of the month, Professor H. H. Rusby speaking on "The Necessity of Botanical Identification as a Basis for Other Pharmacopœial Work," and Professor Henry Kraemer on "Botany as a Hobby and Useful Science for Pharmacists."

May, 1909.—At the stated meeting, the last for the season, held on the 6th of the month, Mr. Beringer offered a motion, suggesting that the Philadelphia Branch hold a scientific meeting in connection with the exhibition at the Convention of the A. M. A. in June for the purpose of reading and discussing papers of joint interest to pharmacists and physicians, and that physicians be invited to attend this meeting, which was carried. Prof. Cook, Chairman of the Committee on Improvements in the N. F., brought in a report, recommending to send a circular letter to each member of the Branch asking them to state their views in reference to changes in formulas, additions, deletions, etc. This recommendation was adopted. The following papers were read and discussed at this meeting: "The Compound Powder of Pepsin and the Compound Elixir of Pepsin of the N. F.," by George M. Beringer; "The Syrups of the National Formulary," by E. Fullerton Cook: "A Comparative Description of the Formularies of the World." The latter brought out some interesting information not generally available, and will be found in abstract in the Bulletin A. Ph. A., June, 1909, 187.

The Scientific Section of the Philadelphia Branch held an interesting meeting on the 13th of the month, the program being devoted to a con-

sideration of ergot. Dr. Clarence A. Hofer presented a paper on "The Standardization of Ergot Physiologically," Dr. H. C. Wood, Jr., a paper entitled "A Chemical Method for the Assay of Ergot," and Dr. C. E. Vanderkleed presented "Some Notes on Testing Ergot." The papers were discussed by Drs. Dunn, Stanislaus, Stewart, Voght and Beates.

Pittsburg Branch.

January, 1909.—Pursuant to the action of the Board of Directors of the Pittsburg College of Pharmacy, and as a result of the untiring efforts of Dr. Julius A. Koch, a Local Branch of the A. Ph. A. was organized at Pittsburg on the 28th of the month, Dr. Koch being elected President and Mr. B. F. Pritchard, Secretary, the organization being completed by appointing the following committees: Membership, W. R. Bell, chairman; Practice, L. Emanuel, chairman; Medical Relations, A. F. Judd, chairman; Education and Legislation, J. R. Thompson, chairman; Publicity, J. H. Beal, chairman—the five chairmen of these committees composing an Executive Committee. This committee, with the president and secretary, held a short session and reported a program for the next meeting, the date of which was fixed for the second Tuesday in March.

March, 1909.—No record of this meeting was available for this report. According to the program reported at the organization meeting, the following topics were to be presented at this meeting: "Pharmaceutical Legislation for Pennsylvania," by John C. Wallace; "Statistics upon the Effect of Phenol Legislation in the Cities where Such Ordinances were in Force," by W. R. Bell; "U. S. Revenue Laws in Relation to the Compounding of Alcoholic Medicines by Pharmacists," by B. E. Pritchard; "The Work of the Council of Pharmacy and Chemistry of the American Medical Association," by J. A. Koch, "Symposium upon Difficulties Met With in Prescription Practice" to be led by Louis Emanuel.

April, 1909.—The third meeting of the Branch was held on the 13th of the month. Dr. Emanuel precipitated an interesting discussion on the liability of the pharmacist under the provisions of the newly enacted State law concerning the sale of phenol. A commendable feature at this meeting was an exhibition of some fifty actual prescriptions gathered from various stores, thrown upon the canvas through the medium of lantern slides, by Dr. Louis Saalbach. Mr. Henry Utech submitted a paper entitled "A Brief Review of the Present Status of Pharmaceutical Education"; "How does the Guaranty of Purity under the Law Protect the Pharmacist?" was the title of a paper presented by Mr. B. E. Pritchard; Mr. Chas. J. Meyers read a paper on "Liquid Force, the World's Greatest Health Drink," which was shown to be merely ordinary "pop" and to contain a trifling per cent. of alcohol; and Dr. A. F. Judd made some informal remarks, indicating that some prescription chemicals could be easily and economically prepared extemporaneously at much saving of

cost and a great addition to our knowledge and experiments. The following resolution, reported by a Committee composed of J. H. Beal, J. A. Koch and Louis Saalbach, was unanimously adopted and approved and referred to the A. Ph. A. for official sanction:

Resolved, That when changes and improvements are made in the formulæ of the National Formulary by the Committee on National Formulary the said changes and improvements should be officially adopted by the Council and by the American Pharmaceutical Association and should be considered as constituting a part of said National Formulary from the date of such official adoption.

May, 1909.—The stated meeting was held on the 11th of the month. A communication from Henry C. Blair (Philadelphia), expressing doubt as to the wisdom of exploiting N. F. preparations in the Ethical Propaganda movement, because many of them are faulty in composition, having recently been received by the Secretary. Mr. Blair's letter was referred to Mr. Geo. W. Kutscher, who at this meeting presented a paper on the subject, which may be consulted in the Bulletin A. Ph. A. of June, 1909, 191–192. It is necessary here to say only that he does not share Mr. Blair's opinion that we cannot confine our efforts to the U. S. P. preparations if we wish to wean the physician from prescribing proprietary medicines, and that the N. F. preparations particularized in Mr. Blair's letter can easily be improved so as to become presentable. "The Cinchona Barks," referred to Dr. A. F. Judd for a paper, was informally discussed together with some other drugs, and particularly powdered colchicum, which was found to be adulterated to the extent of fully 50 per cent. with powdered foenugreck. An interesting communication was also received from the Internal Revenue Department in reply to a recent paper by Mr. Pritchard criticising the actions and rulings of the department.

City of Washington Branch.

November, 1908.—Pursuant to a call issued by a number of A. Ph. A. members resident in the City of Washington, a meeting was held with the object of organizing a Local Branch under the rules established by the Association for such organizations. After the adoption of a Preamble and Rules for the government of the Branch, the organization was effected by the election of officers and standing committees. Dr. Harvey W. Wiley was elected President, Mr. Martin I. Wilbert, Secretary, and the following committees were constituted: On Membership—Augustus C. Taylor, Chairman; On Legislation—Willard S. Richardson, Chairman; On Medical Relations—Frank C. Henry, Chairman; On Publicity—Lewis Flemer, Chairman, and On Research, Lyman F. Kebler, Chairman—these chairmen, with the other officers of the Branch, composing the Executive Committee. The meetings of the Branch will be held monthly from October to May inclusive.

December, 1908.—At this meeting, held on the 14th of the month, Dr. Wiley, the president, delivered an enjoyable and interesting address in which he outlines the important work that will engage the attention of the Branch, and particularly in its relation to the National Food and Drug Law which by its provision permitting the sale of pharmacopœial articles deficient or differing in strength from the standards of the U. S. P. could be and was being abused. A number of papers were presented and interestingly discussed, among them the following: "The Analysis of Headache Powders," by Dr. W. O. Emery; "The Assaying of Drugs," by Dr. C. E. Parker; "Adulterated Drugs," by Dr. L. F. Kebler. The discussion on these papers was participated in by several visitors from other Branches, among them Mr. H. P. Hynson and Mr. John F. Hancock of the Baltimore Branch. Tentative programs were announced for the meetings of January to May, 1909, inclusive.

January, 1909.—At this, the second stated meeting of the Branch, Dr. Wm. C. Woodward opened the discussion on the topic announced for the evening—"Restriction of the Sale of Habit-forming Drugs," calling attention to the apparent encroachment on the rights of the individual, that was entailed in the regulating of any article or articles. This encroachment, however, he considers as being more apparent than real, as ownership itself is held only on the implied condition that no harm is done to others than the owner. The discussion, covering the various possibilities that existed for regulating the sale of habit-forming drugs, the responsibilities of the retail druggist, and the existing laws which are now on the statute books of every state, was participated in by many of the members present. It was suggested by Dr. Geo. H. Kober that, after all, the most important factor in combating the use of habit-forming drugs, is education, which should be provided for physicians and pharmacists as well as for the public.

February, 1909.—The third stated meeting of the Branch was held on the 9th of the month, the general subject for discussion being "The Need for the Physiological Testing of Drugs." The first paper was on "Physiological Standardization of Sera," by Dr. Milton J. Rosenau, who discussed briefly the nature and importance of toxins, and outlined the production and the nature of the antitoxins by successive injection of toxins. Dr. Worth Hale discussed "Physiological Testing in the Control of Drugs," pointing out that progress in medicine is generally indicated by greater accuracy and simplicity. In place of the so-called gun-shot mixtures of a generation or more ago, simple remedies are being used. This progress in the administration of medicines has been brought about entirely by the work done by pharmacologists and the experimental demonstration of the action and uses of active medicaments. Dr. W. Salant spoke of the need for "The Study of Drugs in Pathologic Conditions," and Dr. Albert C. Crawford discussed "Some Little Understood Phases of Biologic Testing."

The general discussion following the reading of these several papers was participated in by Dr. Reid Hunt, Dr. Anderson, Dr. Schulz, Dr. Rosenau, Dr. Kebler, Mr. Chestnut, Mr. Parker and Mr. Hilton.

March, 1909.—The stated meeting of the Branch was held on the 9th of the month, and was devoted to a discussion of the National Formulary. Dr. Lyman F. Kebler discussed the nomenclature of the N. F., pointing out a number of defects which should be eliminated so as to bring it into harmony with the legal requirements; while Mr. Alexander Muncaster, a former druggist, now a member of the local bar, discussed the legal aspect of the nomenclature of drugs, more particularly in connection with the provisions of the Food and Drug Law. Discussing the revision of the National Formulary, Mr. Samuel L. Hilton suggested that the next revision be made jointly by the American Pharmaceutical Association, the American Medical Association, and representatives from the U. S. Department of Agriculture, Bureau of Chemistry, the U. S. Army, the U. S. Navy and the U. S. Public Health and Marine Hospital Service. Mr. Hilton also discussed some of the formulas which, in his opinion, are sadly in need of treatment. The general discussion following was in line with the arguments and statements made by the previous speakers, and clearly emphasized the necessity for a careful revision of the Formulary.

April, 1909.—The stated meeting of the Branch was held on the 13th of the month, the topic for discussion being "The Use of the Compound Microscope in Pharmacy." Professor Burton J. Howard described the compound microscope and discussed the nature and the cost of the apparatus necessary for work in connection with dry analysis. Mr. W. W. Stockburger discussed the use of the microscope in detecting drug adulterations, enumerating a number of drugs and their adulterants and pointing out that the compound microscope offered a ready means for distinguishing between them. Interesting remarks in connection with this subject were also made by Dr. Motter and Dr. Kalusowski.

May, 1909.—The stated meeting of the Branch was held on the 11th of the month, and was devoted to a discussion of the National Formulary questioning, among which the desirability of eliminating from the pages of the Formulary every preparation that might be classified as a "booze" medicine. Mr. Lewis Flemer read a paper on "The Use of Fluidextracts in Elixirs of the National Formulary and Some Suggestions on the National Formulary in General," in the course of which he pointed out that the three cardinal requisites, for all medicinal products, from a pharmaceutical point of view, should be uniformity in potency, permanency, and appearance. He doubts if all or any of these requirements can be obtained in elixirs if fluidextracts are used in their preparation. Mr. Augustus Carrier Taylor presented a paper on "Some Superfluous Preparations in the N. F.", and Mr. M. I. Wilbert presented a communication on "Some of the Changes that have been Proposed by the Committee on

National Formulary," in which he pointed out that unless the pharmacists of this country took an active interest in and coöperated in the revision of the N. F. this book cannot be made more representative of the best of American Pharmacy and will not reflect, as it should, the most advanced practices in the science of medicine.

Proceedings of State Pharmaceutical Associations, 1908.

As in the experience of previous years the official proceedings of State Pharmaceutical Associations that have reached the reporter did not reach quite fifty per cent. of the total number of meetings held, only 21 printed copies being available. It is somewhat irregular also that some associations which in past years have sent copies of their proceedings regularly, have in recent years failed to so compliment the Association. For several years the Reporter has endeavored to supply this deficiency by referring to the reports appearing in the pharmaceutical journals; but apart from the fact that the information so gathered was only fragmentary, and lacked official character, this entailed a great amount of work that, under the circumstances, appears of questionable utility, and the following account of the work in the State Pharmaceutical Association is therefore confined to the information obtained from the official proceedings received:

Alabama.—The Twenty-Seventh Annual Meeting of the Alabama Pharmaceutical Association was held at Blount Springs, June 9 and 10, 1908, in four sessions. Sam A. Williams, of Troy, was elected President; W. E. Bingham, of Tuscaloosa, Secretary. Interesting topics that were freely discussed were the reports on the Progress of Pharmacy, of the Board of Pharmacy, of the Legislative Committee, on Commercial Interests, from the delegation to the American Pharmaceutical Association, and of the National Association of Retail Druggists, and the following papers were read:

"Prescription Department Specialties," by L. Whorton.

"What is the Best Method of Calling the Attention of Physicians to N. F. Preparations?" by Frank Ravenscroft.

"Prescription Statistics—An Analysis of 1900 Prescriptions," by Emerson R. Miller.

"Olive Oil," by Emerson R. Miller.

"The Best Method of Advertising a Drug Store," by D. H. Fulton.

"Sociability Among Druggists," two papers, by Dr. T. J. Hughes and Frank Ravenscroft.

"Influence of Thought Forces upon the Mind and Mechanism of Man," by Dr. T. J. Hughes.

"Assisting the State Board," by Crawford T. Ruff.

The Association adjourned to meet at a time and place decided by the Executive Committee.

Arkansas.—The Twenty-sixth Annual Meeting of the Arkansas Association of Pnarmacists was held at Little Rock, May 12, 13 and 14, 1908, in six sessions. Frank Schachleiter, of Hot Springs, was elected President; Miss Mary A. Fein, of Little Rock, Secretary-Treasurer. Among the topics that elicited animated discussion, Legislation, Trade Interests, the U. S. Pharmacopœia and National Formulary, and the proposed Bill to regulate the appointment of pharmacists in the Public Health and Marine Hospital Service of the United States, may be mentioned. The following papers were read:

"The Dispensing Physician and the Prescribing Druggist," by E. H. Winkler, M. D.

"The Pharmacist and the Fiends," by Horace Chamberlain.

The next annual meeting will be held at Pine Bluff during May, 1909.

Connecticut.—The Thirty-second Annual Meeting of the Connecticut Pharmaceutical Association was held at Waterbury, June 9 and 10, 1908, in three sessions. Robert Walker, of Waterbury, was elected President; John B. Ebbs, of Waterbury, Secretary. Interesting topics that elicited animated discussion were the Report of Pharmacy Commissioners, the N. A. R. D., the Report of the Legislation Committee. The only paper read was the following:

"The Drug Store Insurance," by Robert Walker.

The next annual meeting will be held in 1909 at a time and place to be decided by the Executive Committee.

Georgia.—The Thirty-third Annual Meeting of the Georgia Pharmaceutical Association was held at Thomasville, May 19 and 20, 1908, in three sessions. Ben S. Persons, of Macon, was elected President; Max Morris, of Macon, Secretary. The following topics engaged the attention of the Association: Trade Interests, the Prohibition Law, the Narcotic Bill, the Bill for Inspection, the N. A. R. D. Propaganda of U. S. P. and N. F. Preparations.

The next annual meeting will be held at Macon, the date to be announced later.

Indiana.—The Twenty-Seventh Annual Meeting of the Indiana Pharmaceutical Association was held at Lake Wawasee, June 23–27, 1908, in six sessions. E. W. Stucky, of Indianapolis, was elected President; Maurice P. Schwartz, of Indianapolis, Secretary. The following topics of general interest were discussed: Trade Interests, Education, Pharmacy and Queries, Legislation, the N. A. R. D., and the A. Ph. A. The following papers were read and very thoroughly discussed:

"Some Phases of the Postage Stamp Business," by Chas. C. Deam.

"Therapeutic Action of Salicylates," by Dr. Gross.

"The Relation of the Pharmacist to the Physician," by J. R. Francis.

"Physiological Testing," by Arthur L. Walters.

"The Outlook," by J. M. Barrett, Organizer N. A. R. D.

"What Can a Pharmacist Do?" by Leo Eliel.

"The Country Druggist," by C. E. Elliott.

"Card System in a Drug Store," by M. P. Schwartz.

"Standard Pharmaceuticals," by H. E. Barnard.

"Some Remarks on Taking Care of a Drug Stock," by J. W. Sturmer.

The next annual meeting will be held at a time and place to be decided by the Executive Committee.

Kentucky.—The Thirty-First Annual Meeting of the Kentucky Pharmaceutical Association was held at Estill Springs, June 16, 17 and 18, 1908, in three sessions. L. Grant Smith, of Shelbyville, was elected President; J. W. Gayle, of Frankfort, Secretary. Topics of general interest discussed, were the following: Legislation; The Kentucky Pure Food and Drug Act; The N. A. R. D.; The A. Ph. A. The following papers were read:

"Association Work, Local, State or National! Is it profitable to Individual Druggists?" two papers, by Simon N. Jones and by L. L. Elgin.

"Do the Present Conditions of Pharmacy Justify a Young Man in Studying the Profession?" four papers, by R. H. White, by J. O. Cook, by Simon N. Jones, and by Gordon L. Curry.

"Pure Food Analyses," by B. M. Overton.

"How Can the Injurious Effects of Dispensing by Physicians be most successfully combated?" by Simon N. Jones, and by Robt. S. Berryman.

"How to Increase the Interest of the Medical Profession in the U. S. P. and N. F. Preparations?" by C. W. Tibbals.

"How Do the Pharmacists of Today Compare With Those of Thirty Years Ago?" by Simon N. Jones.

"What Co-operative Conditions Do and Should Exist Between Physicians and Pharmacists?"—three papers: by Addison Dimmitt, by R. H. White, and by L. L. Elgin.

"The Merry Widow!"—two papers: by Mrs. S. J. Driskell and Mrs. Chas. A. Leathers.

"The Merry Widow—The Optimist—The Pessimist," by Eleanor Diehl.

"The Drummer's Dream," by Geo. Budde.

The next annual meeting will be held at Cerulean Springs, June 15, 16 and 17, 1909.

Louisiana.—The Twenty-Sixth Annual Meeting of the Louisiana State Pharmaceutical Association was held at New Orleans, May 12 to 16, 1908, in three sessions. Adam Wirth, of New Orleans, was elected President; George W. McDuff, of New Orleans, Recording Secretary. Topics of general interest discussed were the following: Louisiana's New Law; Trade Interests; The Pure Food and Drug Law; U. S. P. and N. F. Preparations; Pharmacy and Queries; Adulterations. The following papers were read:

"Woman's Sphere in Pharmacy," by Mrs. Sophie Wagner.

"Popularizing U. S. P. and N. F. Preparations."

Maine.—The Forty-first Annual Meeting of the Maine Pharmaceutical Association was held at Kineo, June 23 and 24, 1908, in —— sessions. Henry J. Hatheway, of Honeton, was elected President; M. L. Porter, of Danforth, Secretary. An interesting discussion followed an address by Dr. Woods, in which he explained to the members the working of the Maine Food and Drug Law.

The Association adjourned subject to the decision of the Executive Committee both as to time and place of the next annual meeting.

Maryland.—The Twenty-sixth Annual Meeting of the Maryland Pharmaceutical Association was held at Ocean City, June 23 to 26, 1908, in five sessions. W. M. Fouch, of Baltimore, was elected President; E. F. Kelly, of Baltimore, Secretary. The following topics of general interest were discussed: Adulterations; The William Procter, Jr., Monument Fund; On Legislation; On Pharmacy; The N. A. R. D. The following papers were read:

"Antipyretics," by H. Engelhardt.

"Notes on Hypnotics," by H. Engelhardt.

The next annual meeting will be held at the Blue Mountain House, June 22–25, 1909.

Minnesota.—The Twenty-Fourth Annual Meeting of the Minnesota State Pharmaceutical Association was held at Alexandria, June 17, 18 and 19, 1908, in five sessions. Geo. H. Goodrich, of Anoka, was elected President; Theo. F. Leeb, of Winona, Secretary. An interesting feature was the address of welcome delivered by Senator Nelson, in which he depicted in a masterly manner the gradual development of the territory of Minnesota into a great state, and incidentally the development of the immediate region in which the meeting was being held. Topics of general interest discussed were: The U. S. P. and N. F. Propaganda, the Revision of the U. S. P., on Legislation, the Pure Drug Law, on Adulterations, on Drug Store Fire Insurance, on Trade Interests, the N. A. R. D., and the A. Ph. A. The following papers were read:

"What Constitutes Practicability in a Druggists' Association Paper?" by Thos. V. Wooten.

"Changing Conditions in Pharmacy," by A. J. Kline.

"Board Examinations from the Viewpoint of One of the Examiners," by R. L. Moreland.

"Three Things Necessary to Bring About a More General Use of U S. P. and N. F. Preparations," by Chas. H. Huhn.

"The Pharmacopœia and National Formulary," by Dr. Hensel.

"The Decadence of Therapeutic Nihilism," by Edgar D. Brown, M. D.

"College of Pharmacy of the University of Minnesota—Historical," by Dean Wulling.

"The Pharmacist and the Liquor Problem," by John Nielson.

The next annual meeting of the Association will be held at a date and place to be decided by the Executive Committee.

Missouri.—The Thirtieth Annual Meeting of the Missouri Pharmaceutical Association was held at Pertle Springs, Warrensburg, June 9–12, 1908, in six sessions. D. V. Whitney, of Kansas City, was elected President; Henry M. Whelpley, of St. Louis, Permanent Secretary. Interesting topics discussed were presented in the reports on Legislation, on National Formulary, on the Pharmacopœia, and on Papers and Generics. The following papers were read:

"Scotch Medicine," by J. F. Llewellyn.

"Marked Changes in Several Official Fluidextracts," by Francis Hemm.

"The Doctor as a Pharmacist," by H. G. Pieper.

"The Drug Store of To-Day," by Chas. W. Stockhausen.

"Commercial Pharmacy," by F. V. Johnson.

"Membership in the Missouri Pharmaceutical Association," by Francis Hemm.

"Some U. S. P. and N. F. Preparations," by Wm. K. Ilhardt.

"An Experience at the Prescription Counter," by Ambrose Mueller.

"The A. M. A. and A. Ph. A., and the U. S. P. and N. F.", by Otto F. Claus.

"The Official Syrups," by Wm. Mittelbach.

"The Official Tinctures," by Wm. Mittelbach.

"The U. S. P. and N. F. Propaganda," by J. C. Thumser.

"The Missouri Pharmaceutical Association," by Fred. R. Dimmitt.

"The National Formulary," by D. V. Whitney.

"Raising the Money," by W. H. Lamont.

"Chemicals of the Pharmacopœia," by Wm. Mittelbach.

"The Acids of the U. S. P.", by Francis Hemm.

"Potassium and Sodium Salts," by Otis W. Smith.

"Some of the Official Chemicals," by H. M. Pettit.

The Association adjourned to meet on the third Tuesday in June, 1909, at such place as the Committee on Time and Place may designate.

New Jersey.—The Thirty-eighth Annual Meeting of the New Jersey Pharmaceutical Association was held at Atlantic City, June 3, 4 and 5, 1908, in five sessions. George H. Horning, of Roselle Park, was elected President; Frank C. Stutzlen, of Elizabeth, Secretary. The following reports gave interesting topics for discussion: On Legislation, the Bradley Cocaine Act, the U. S. Pharmacopœia, the A. Ph. A., the N. A. R. D., Trade Interests, and Procter Memorial Committee. The following papers were read:

"Kieselguhr as a Filtering Medium," by Chas. H. LaWall.

"Disintegration of Tablets," by Geo. M. Beringer, Jr.

"Urinalysis as a Side-line for Pharmacists," by Adolph F. Marquier.

"Syr. Acidi Phosphorici Comp.," by Adolph E. Marquier.

"Query No. 1," by Herman Weller.

"Types of Filled Prescriptions," by E. Fullerton Cook.

"Practical Application of Propaganda Work," by Henry Schmidt.

"The Necessity for Pharmacists to Become Interested in Pharmaceutical Legislation," by H. J. Lohmann.

"Improved Aceton Cantharidal Collodion," by George M. Beringer.

"Suggestions for Improvements in U. S. P.," by George M. Beringer.

"Troches of the U. S. P.," by John F. Hancock.

"What Should be Omitted, Added or Improved in the U. S. P.," by Dr. P. E. Hommell.

"A Few Thoughts on Pharmacopœial Preparations," by Edward A. Sayre.

The Association adjourned to meet at Lake Hopatcong in 1909.

North Carolina.—The Twenty-Ninth Annual Meeting of the North Carolina Pharmaceutical Association was held at Morehead City, June 8, 9 and 10, 1908, in seven sessions. J. E. Shell, of Lenoir, was elected President; P. W. Vaughan, of Durham, Secretary. Interesting reports were received from the Committees on Adulteration, on Legislation, on the Prerequisite Bill, and on a Year's Review in Pharmacy. The following papers were read:

"Answers to 16 Queries on Various Subjects," by William Niestlie.

"The United States Pharmacopœia a Legal Standard," by Joseph P. Remington.

"Drug Store Advertising," by Max T. Payne.

"The Advancement of Pharmacy in North Carolina," by Chauncey T. Eldridge.

The Association adjourned to meet at Greensboro, June 23–25, 1909.

North Dakota.—The Twenty-Third Annual Meeting of the North Dakota Pharmaceutical Association met at Devil's Lake, August 4, 5 and 6, 1908, in four sessions. Oscar Hallenberg, of Fargo, was elected President; W. S. Parker, of Lisbon, Secretary and Treasurer. Interesting reports were received from the Legislative Committee, on Trade Interests, and from the delegation to the A. Ph. A. and the N. A. R. D. The Association adjourned to meet at Grand Forks, Tuesday, Aug. 3, 1909.

Ohio.—The Thirtieth Annual Meeting of the Ohio State Pharmaceutical Association was held at Cedar Point, July 7 to 10, 1908, in four sessions. T. B. Huston, of Toledo, was elected President; Theo. D. Wetterstroem, of Cincinnati, General Secretary. Among the interesting topics discussed the following may be mentioned: Adulteration; Education; the Ohio Food and Drug Law; Trade Interests; Fire Insurance; Pharmacy Laws. The following papers were read:

"Part V. Contribution to the History of Ohio," by Prof. Feil.

"The Quality of Drugs Dispensed by Some Physicians," by J. H. Beal.

"The Real and the Imitation," by L. H. Witte.

"Six Questions and Remarks," by L. H. Witte.

"Experiments in Making Tincture of Opium, U. S. P., VIII," by W. T. Hankey.

"Some Points in the Assay of Laudanum," by Geo. D. Beal.

"Tincture of Iodine," by Theo. Wetterstroem.

"Coloring with Cudbear," by G. M. Towle.

"An Ingenious Adulteration of Commercial Aniline Red," by G. D. Beal.

"Powdered Tragacanth," by Jos. Feil.

"Violations of the Pharmacy Law," by W. F. Kaemmerer.

The next annual meeting of the Association will be held at Cedar Point, July 13–16, 1909.

Pennsylvania.—The Thirty-First Annual Meeting of the Pennsylvania Pharmaceutical Association was held in Paxinosa Inn, Easton, June 23, 24 and 25, 1908, in five sessions. Lucius L. Walton, of Williamsport, was elected President; Edgar F. Heffner, of Lock Haven, Secretary. Interesting reports were received from the delegations to the A. Ph. A., the N. A. R. D., and a number of State Associations, and from the Trade Interests, on Adulterations, on Papers and Queries, and on Botany. The following papers were presented:

"A Plan for the N. A. R. D.," by Christopher Koch.

"A Source of Profit for Pharmacists," by Wm. O. Frailey.

"At How Much Should a Pharmacist 'Figure' His Time in Filling Prescriptions," by Wm. B. Greenwalt.

"A Reversal of Policy, by Wm. O. Frailey.

"Laboratory Notes," by I. V. Stanley Stanislaus.

"Ethical Propaganda," by B. F. Pritchard.

"Bold Attempt at Substitution," by Frederick E. Niece.

"Beef Extracts," by Henry A. Bradshaw.

"Preparation of Tinctures from Assayed Drugs," by Chas. E. Vanderkleed and L. Henry Bernegau.

"Disorganized Organization," by J. Leyden White.

"Is the Soda Water Business a Profitable or Necessary Part of the Modern Drug Store?" by R. H. Lackey.

"Improved Elixir Terpin Hydrate," by P. Henry Utech.

"Orange Flower as a Perfume and Flavor," by Wm. G. Greenwalt.

"Ozone, Peroxides and Perborates as Oxygen Producing Agents," by James S. Cleghorn.

"Professional Pharmacy," by E. Fullerton Cook.

"Multiplicity of Organizations Does Not Impose Too Heavy a Tax Upon the Retail Druggist," by Charles E. Willets.

"Is the Free Distribution of Antitoxin by the State Worth While?"—two papers: by Samuel G. Dixon, M. D., and by D. E. Brendel.

"Formation of Precipitates in Enzyme Elixirs by Solutions of Iodides," by Henry C. Blair.

"Is it Profitable to Buy a Year's Supply of Patent Medicines, for the Doubtful Advantage of Having Your Name Inserted in the Newspaper Advertising?"—two papers: by John K. Thum and by Franklin M. Apple.

"Query No. 15 (Question of Offering Your Own Preparation in Place of a Proprietary Medicine Demanded?)," by Walter W. Bauder.

"When Essence of Peppermint is Called For is it Customary to Consider it a Synonym for U. S. P. Spirit of Peppermint?" Two papers, by John T. Harbold and by George M. Beringer.

"What is Meant by Hoffmann's Anodyne?" by George M. Beringer.

"Best Plan to Meet the Aggressive Physician's Criticism, to his Patient, of Your Prescription Prices," by Franklin M. Apple.

"Redivivus," by Joseph P. Remington.

"Remarks on Pharmacy Board Examinations," by Louis Emanuel.

"Strontium Bromide, U. S. P., VIII," by Ambrose Hunsberger.

"Some Applications of the Federal Food and Drug Act," by Willard Graham.

"The Prescription Store and Patent Medicines," by Edgar F. Heffner.

"The Vagaries of Law," by B. F. Pritchard.

"The Trend of Education in Matters Medical," by M. I. Wilbert.

"The Multiplicity of Associations for Pharmacists and Druggists," by M. I. Wilbert.

"The Convenient Capsule," by J. P. Remington, Jr.

"The Estimation of Acetanilid, Phenacetin, Heroin and Heroin Hydrochloride," by Edward S. Rose and Maxwell M. Becker.

"The All-four Powder Mixer," by Isaac M. Weills.

"The Label and the Law," by Chas. H. LaWall.

"The Legalizing of Denatured Alcohol," by Henry F. Decker.

"U. S. P. and N. F. Propaganda," four papers, by Dr. L. Franke, F. M. Apple, Christopher Koch Jr., and Frank H. Cope.

"What of the Future of Medical Practice?" by Joseph W. England.

"Why the Pharmacist Should Make His Own Preparations," by Edgar F. Heffner.

"Would not a Salesmanship Course be a Good Thing for Most Pharmacists?" by James S. Cleghorn.

"Women in Pharmacy," by Miss Mary E. Tassell.

"What was the Most Attractive Window Display used by You during the Year?" by R. H. Lackey.

"Your Library, or what is to be Gained by Individual Ownership," by C. L. Bonta.

Tennessee.—The Twenty-Third Annual Meeting of the Tennessee Pharmaceutical Association was held at Sewanee, July 21, 22 and 23, 1908, in six sessions. D. A. Rosenthal, of Knoxville, was elected President; E. F. Trolinger, of Nashville, Secretary. Topics of interest discussed were: Trade Interests; Publicity; Legislation; Definitions of Proper Labeling

under the Tennessee Pure Food and Drug Law; Drug Store Fire Insurance. Interesting addresses were made by Vice-Chancellor Wiggins, of the University of the South, and by Lucius M. Brown, Inspector under the Pure Food and Drug Law. The following papers were read:

"What the Public Expects from the Druggist, and the Credit He Gets," by Samuel C. Davis.

"How to Make a Soda Fountain Pay," by D. H. Neil.

"Benefits and Advantages of the Pharmacist Keeping Posted," by W. R. White.

"Why Should You Become a Member of the Pharmaceutical Association," by Ira B. Clark.

"How to Make the Drug Store Pay," by David J. Kuhn.

"The Best Side-Line to Handle both from a Professional and Financial Standpoint," by Samuel C. Davis.

The Association adjourned to meet at Sewanee, on the third Tuesday in July, 1909.

Texas.—The Twenty-Ninth Annual Convention of the Texas Pharmaceutical Association was held at Galveston, July 16–19, 1908, in four sessions. B. W. Fearis, of Waxahachie, was elected President; R. H. Walker, of Gonzales, Secretary-Treasurer. Interesting topics that engaged the attention of the Association at this meeting were: Practical Pharmacy, Pharmaceutical Education, the State and National Pure Food Law, the N. A. R. D. Epitome, the U. S. P. and N. F. The following papers were read:

"Compound Solution of Cresol," by R. H. Needham.

"Selling Your Own Preparations," by Henry F. Lackey.

"Some Grafters I Have Known," by Walter H. Cousins.

"What Are You Doing," by Walter B. Adams.

"Shall Pharmacy Remain a Profession," by Ernest Stubbs Morris.

"Early Drug Stores of Galveston," by B. A. Turk.

"How to Use the Pharmacopœia and the National Formulary," by E. G. Eberle.

"How the U. S. P. and N. F. Work in Texas," by J. W. Covey.

The Association adjourned to meet in San Antonio, June 15, 16 and 17, 1909.

Vermont.—The Fifteenth Annual Meeting of the Vermont State Pharmaceutical Association was held at Burlington, June 17 and 18, 1908, in four sessions. Wm. R. Warner, of Vergenes, was elected President; W. E. Terrill, of Montpelier, Secretary. Interesting reports were received and discussed from the following committees and delegations: The American Pharmaceutical Association, the National Association of Retail Druggists; on Constitution and By-Laws, on Publicity. The following papers were read:

"The Value of a Pharmaceutical College Course," by A. O. Austin.

"Pharmacy in a General Merchandise Store," by F. D. Pollard.

"Observations on the U. S. P. and N. F. Propaganda," by W. H. Zottman.

The Association adjourned, leaving the time and place for the next annual meeting to the Executive Committee, with the recommendation that it be held in the vicinity of Lake Bomoseen.

West Virginia.—The Second Annual Convention of the West Virginia State Pharmaceutical Association was held at Charleston, June 2 and 3, 1908, in five sessions. Arch Krieg, of Charleston, was elected President; F. S. Johnston, of Elkins, Secretary. The following interesting reports were received and discussed: On Traveling Men's Auxiliary, on Trade Interests, on Legislation, the N. A. R. D., on Co-operative Fire Insurance. Prof. J. U. Lloyd delivered an address, which was received with great applause. The following papers were read:

"The Making of a Successful Pharmacist," by F. P. Landon.

"How to Promote the Interest of the Medical Profession in the U. S. Pharmacopœia," by Wallace Procter.

"How to Interest the Doctors in N. F. and U. S. P. Preparations," by W. C. Gordon.

The Association adjourned to meet at Morgantown in June, 1909.

Wisconsin.—The Twenty-Eighth Annual Meeting of the Wisconsin Pharmaceutical Association was held at Elkhart Lake, June 22–26, 1908, in five sessions. W. W. Albers, of Wausaw, was elected President; E. B. Heimstreet, of Janesville, Secretary. Interesting reports received and discussed were: Draft of a Bill for a Model Law; on Trade Interests; the American Pharmaceutical Association; the State Board of Pharmacy; on Adulterations; the Pharmacy Course at the University; on Proprietary Preparations Sold as Prescriptions; on Propaganda Work. The following papers were read:

"Practical Hints," by E. G. Raeuber.

"The Drug Store Man," by Edw. Williams.

"Card Signs that Sold Goods," by Edw. Williams.

"The 'Ideal Boss'—Will He Not Solve the Clerk Problem?" by —— (?)

"Commercial Pharmacy," by —— (?)

"Watch Yourself Go By," by —— (?)

"Home-made Show Cards," by A. R. Eberle.

"In what Direction Can the Druggist Extend His Commercial Activities with Success?" by F. M. Charlesworth.

The Association adjourned to meet at Elkhart Lake, June 22–25, 1909.

PHARMACY.

A. Apparatus and Manipulations.

Standard for Drops of Medicinal Substances—Principles Governing Size and Weight.—In his investigation of the size and weight of drops, Eschbaum arrived at the following general principles, as reported in a recent communication to the Deutsche Chemische Gesellschaft:

1. The weight of a drop of any given liquid is directly proportional to the area of the dropping surface.

2. The temperature of the liquid and the velocity with which the drops are delivered, may be neglected in ordinary practice, provided the delivery be not too rapid.

3. The weight of the drop varies with the nature of the liquid.

4. A drop of a mixture of two liquids has a weight lying between the weights of the drops of the components; this property is, however, not additive.

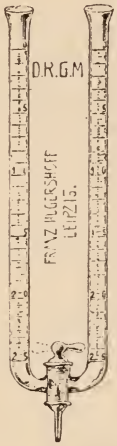
5. The weight of a drop of a solution of a solid or liquid substance may, for practical purposes, be taken equal to that of the solvent.

The shape of the dropping surface has no influence upon the weight of the drop. Thus, it is immaterial whether a pipette or a dropping bottle be used. The drop does not become detached from the glass, but from a layer of liquid covering the latter. The author arranges the pharmaceutical liquids investigated by him into four groups. The first group comprises water and aqueous solutions; the second, Fowler's solution, medicinal wines, etc.; the third, bitter almond water and solutions in the same, opium tinctures, fluidextracts, etc., and the fourth, alcohol and alcoholic solutions (tinctures), ether, chloroform and similar liquids. The liquids in any one group give drops of the same size, when delivered from a bottle or pipette, with the same area of dropping surface.—Nat. Drugg., Jan., 1909, 19.

Short Double Burette—Advantage over Usual Form.—During the prolonged use of burettes of the ordinary (long) form, various inconveniences manifest themselves and particularly in the reading, which necessitates the frequent rising from the sitting posture in order to bring the eye on a correct level with the scale. This is obviated by Tschaplovitz by shortening the burette to 20 or 30 Cm. and, in order to accommodate larger quantities of volumetric solution, constructing it with two such burettes, united with a two-way cock, as shown by Fig. 1. The advantages are obvious. When the solution in one limb is consumed, the titration is continued with the solution in the other, the first being refilled as opportunity permits.—Pharm. Ztg., liii (1908), No. 92, 910.

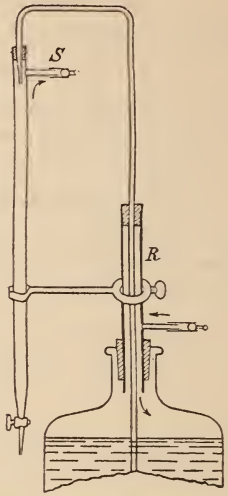
Burette with Reservoir Attachment.—Convenient Construction.—Dr. von Heygendorff describes the new burette with reservoir attachment

FIG. 1.



Short Double Burette.

FIG. 2.



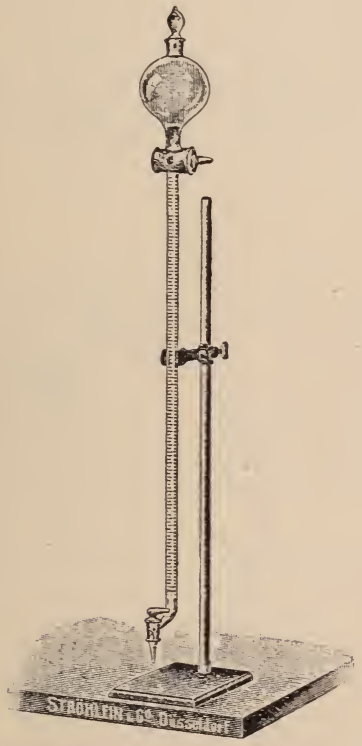
Burette with Reservoir Attachment.

shown by Fig. 2, which is readily constructed by one having ordinary skill in glass blowing from material usually found in the laboratory. A stout glass tube (*R*), about 30 Cm. long, 16 Mm. external diameter and 12 Mm. internal calibre, is provided with a short lateral tube as shown in the drawing, this ending in a short section of rubber tubing closed with a glass stopper. A similar lateral tube (*S*) is blown to the upper part of an ordinary burette. The stout tube being inserted into the reservoir flask through a rubber stopper, the flask is united with the burette by means of a thin glass tube, bent twice at right angles and having a longer limb passing in and nearly to the bottom of the flask, whilst the short limb, which is drawn to a point at its extremity, passes through a rubber stopper into the burette and to a little below the inner opening of the lateral tube (*S*), longer limb being held in place by a rubber stopper, or by means of rubber tubing, and observing that these connections are air-tight. The flask being filled with the volumetric test liquid, the burette may be filled after opening both lateral tubes, either by suction at *S* or by blowing into *R*, the latter being then closed with the glass stopper so as to preserve the contents of the flask from the action of the external air. When the titration is completed, both lateral tubes are closed for the same reason.—Pharm. Ztg., liv (1909), No. 16, 159.

Burette with Reservoir—Automatic Adjustment of Supply to Zero.—A burette provided with a reservoir (300 Cc. capacity) and a device per-

mitting automatic adjustment of the supply to zero is shown by Fig. 3. On closing the supply cock air is admitted into the interior of the burette through a small lateral opening in the stopper, thus permitting the withdrawal of the volumetric solution from beneath. The advantages of this automatic arrangement are obvious, since adjustment to the zero can be effected quickly for each titration when a number of consecutive titrations are to be made with the same solution, while the supply in the reservoir

FIG. 3.



Burette with Reservoir.

FIG. 4.

Suction Pipette.

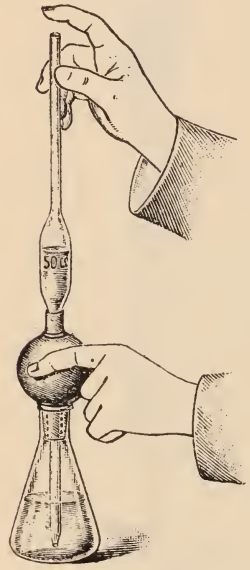
may be replenished conveniently without interference with the titrations. The apparatus is supplied by Ströhlein & Co., Düsseldorf.—Pharm. Ztg., liv (1909), Nos. 29, 290.

Suction Pipette—Convenient Construction.—M. Wolff describes the suction pipette shown by Fig. 4, which is easily constructed from material usually found in a microscopical laboratory, and is particularly serviceable in microscopic work. It consists of the usual pipette-tube, which is prolonged at the shoulder by an extension of convenient length to reach well into an inverted object vial, such as is commonly used for the preservation of microscopic objects. The diameter of this vial should be such that it

will conveniently and loosely cover the pipette tube, and the connection is made by means of a short section of pure rubber tubing which, while slipping up and down the tube freely when lubricated with a little paraffin oil or vaselin, must be expanded in order to slip over the inverted vial, and thus fits tightly. The vial being depressed so that the rubber touches the shoulder of the pipette, the point of the latter is introduced into the fluid which enters the pipette by the suction produced on raising the vial and held securely; it may then be delivered, drop by drop, at will, by gently pressing the vial downward.—Pharm. Ztg., liii (1908), No. 55, 547; from C.-Bl. f. Bakt., 1908, No. 7.

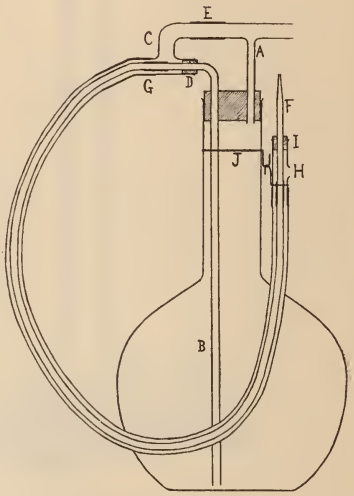
Pipettes—Novel Method of Filling.—Scholvien has contrived a pipette filler which excells in simplicity and efficiency. It consists, as shown by Fig. 5, of a rubber ball provided with two short necks diametrically oppo-

FIG. 5.



Pipette Filler.

FIG. 6.

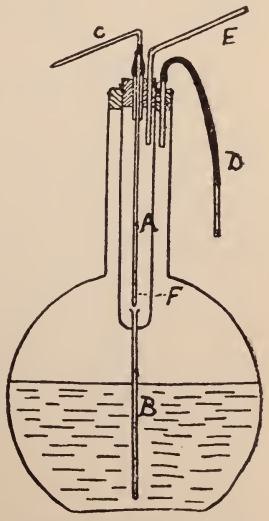


Wash Bottle.

site each other. The pipette being passed through the necks of the ball until it fits closely to the pipette bulb, is introduced into the flask containing the fluid with which it is to be filled, the mouth of which is a concave, into which the ball fits snugly. By a downward pressure, the enclosed air forces the liquid into the pipette, which when filled to the mark is withdrawn from the bottle after closing its outer orifice with the finger. The advantages of this contrivance are self evident. It avoids the necessity of drawing the fluid into the pipette with the mouth, a desideratum of particular importance when operating with corrosive, malodorous or nauseous liquids.—Pharm. Ztg., liv (1909), No. 29, 290.

Compressed Air Wash Bottle—A Convenient Device.—Edwin Dowzard describes the compressed air wash-bottle shown by Fig. 6, which will be found very serviceable where a supply of compressed air is available. The several parts, of glass and rubber, are clearly shown in the drawing and need no detailed description. The flask, which may be stationary and consequently quite large, is closed with a bi-perforated rubber stopper, one of the perforations admitting the compressed air when in use, through the constricted limb of the T-tube *A*, while through the other the delivery-tube *B* passes to near the bottom of the flask. The tube *B*, which is bent at right angles, passes through *D* into the T-tube *C* and is connected at *G* with a rubber tube of the same calibre, enclosed by a second and much larger rubber tube, permitting the free passage of the compressed air through the open glass valve shown at *H*, a glass jet F, connected with the smaller tube passing through the body of the valve, being held in place by a perforated rubber stopper at *I*, and suspended when not in use by means of the wire hooks shown at *J*. The connection of the two T-tubes *C* and *A* having been made, as shown at *E*, compressed air continuously passes through the outer rubber tube and escapes at the vent H; but in placing the finger over the vent, compressed air enters the flask through the vertical limb of *A* and water is ejected from the jet with more or less force, depending on the complete or incomplete closure of the valve at the will of the operator. Thus, the force of the jet may be easily regulated, and sent in any direction by a slight turn of the wrist, or instantaneously intercepted by the removal of the finger from the vent.—Amer. Journ. Pharm., April, 1909, 174–176.

FIG. 7.



Pipette Wash Bottle.

Pipette Wash Bottle—A Device for Delivering Measured Quantities of Water.—T. B. Dallimore describes the "pipette wash bottle" shown by Fig. 7, which makes it conveniently possible to wash precipitates, etc., with measured quantities of water. It consists of a small wash-bottle, *A*, which may be conveniently made from a piece of glass tubing (or a test tube. Rep.) about 6 inches long by 2 inch diameter. To the bottom of this is fused a piece of glass tubing, *B*, slightly opened out above the fused point, to allow the tube, *C*, to be ground into it. This latter tube is sealed at the bottom, but a small hole, *F*, is blown in the side, about ⅜ inch above the sealed bottom, as shown. A slightly larger piece of glass tubing is fastened in the bi-perforated cork for the delivery tube to work in, a piece of india-rubber tubing being stretched over the two, forming a

spring to keep *C* down in its place. The two tubes, *D* and *E*, and the larger reservoir bottle, complete the apparatus. The wash-bottle, *A*, is graduated from a burette, care being taken that *C* is right down in its place, the zero mark coming on a line with the small hole blown into the delivery tube *C*. The whole apparatus is fitted into the larger bottle by means of a rubber stopper. In use the tube, *C*, is slightly raised, and water is forced up, *B*, into the wash-bottle, *A*, by blowing into *D* until the desired mark is reached. *C* is then released, the india-rubber spring carrying it down into its place and making a water-tight joint. The water is then delivered from the jet of *C* by blowing into *E* until the wash bottle is emptied down to the zero mark.—Pharm. Jour., April 17, 1909, 527.

Flat Test Tubes—A Serviceable Form.—O. K. Schmatolla has introduced flat test tubes (see Fig. 8), which possess notable advantages over the ordinary cylindrical form. They are not liable to roll off and when

Fig. 8.

Flat Test-Tube.

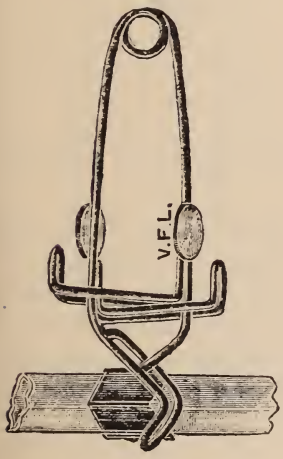
introduced into the water both sink and maintain their position better than the more buoyant cylindrical tubes. Moreover their inferior capacity as well as peculiar shape permits the use of smaller quantities of liquid and the more rapid heating of their contents. Furthermore, they lend themselves particularly well to the determination of melting-points, which are not subject to the influence of capillary adhesion so inconvenient when the determination is effected in capillary tubes. These flat test tubes are supplied in three sizes: 4 x 15, 5 x 16 and 7 x 17 Mm., the lengths corresponding with those of ordinary test-tubes. Flat thermometers, fitting into these flat tubes, are also supplied by the manufacturer.—Pharm. Ztg., lii (1908), No. 100, 989.

Test-tube Holders—Improved Construction.—The test-tube holders now in popular use have the disadvantage that the compressing effect gradually weakens and after a time fails to act, so that the holder becomes useless. Moreover, the holder is not efficient when agitation of the contents of the test-tube is necessary, or when operating with heavy liquids, such as mercury or amalgams. These disadvantages are overcome by H. Stoltzenberg by the improved construction shown in Fig. 9, which permits hand-pressure to be applied at the extremities of the wires composing the clamp, while

the buttons immediately behind serve to release the action of the spring when they are pressed toward each other.—Apoth.-Ztg., xxiii (1908), No. 96, 874.

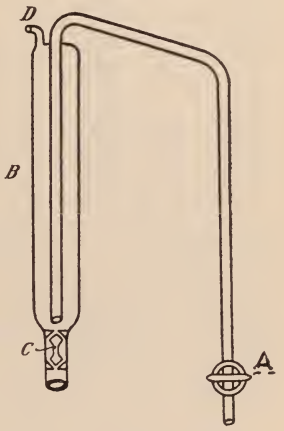
New Glass Syphon—A Convenient Device.—Niemann has devised and constructed a glass syphon intended for the convenient withdrawal of liquids from large shop bottles or carboys as required, which is shown by Fig. 10. It consists of a syphon tube, the longer limb of which is provided with a ground-glass cock (*A*), while the short limb is fitted into a mantle (*B*, *C*, *D*) reaching to a constriction at the bottom enclosing the floating valve (*C*). This consists of a cylindrical float, conical at both

FIG. 9.



Test-tube Holder.

FIG. 10.



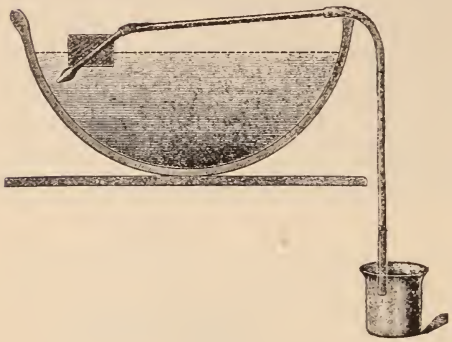
New Glass Syphon.

ends, the lower cone ground so as to snugly close the orifice beneath, and held in a vertical position by pin-points fused to the sides. On introducing the syphon into the liquid to be withdrawn, the float rises and the liquid enters the mantle; if then, by means of a rubber aspirator-bulb, air is forced into the mantle at *D*, the stop-cock (*A*) being open, the float (*C*) closes the lower orifice of the mantle and the liquid syphons over. The outflow may be regulated, stopped and renewed at will by means of the cock (*A*). When the mantle is emptied of its contents it may be refilled by reversing the aspirator-bulb so as to produce suction, and the syphon may then again be put into action by means of the aspirator-bulb restored to its original position.—Pharm. Ztg., liv (1909), No. 37, 363.

Floating Syphon—A Practical Device.—Queisser & Co., of Hamburg, supply the floating syphon shown by Fig. 11, which facilitates the close withdrawal of liquids without disturbing precipitates. As shown, the short limb of the syphon is bent at an obtuse angle at its extremity, which passes

through a float, constructed of light wood for ordinary liquids or of glass for acids and corrosive fluids, and by means of this float is prevented from

FIG. 11.



Floating Syphon.

FIG. 12.

Aluminum Strainer.

sinking deeper than about 1 centimeter beneath the surface of the liquid. Pharm. Ztg., liii (1908), No. 100, 988.

Aluminum Strainers—A Convenient Device.—Ernst Tessler has devised and supplies the convenient strainer shown by Fig. 12. It consists of a small aluminum sieve with slanting walls, so that when inserted into a funnel of the conventional shape they fit snugly against the walls of the latter. Obviously the strainer may be used in different-sized funnels of proper shape, which are thus convertible into straining funnels at a moment's notice.—Pharm. Ztg., liii (1908), No. 64, 627.

Filters and Funnels—Capacity.—Dr. A. B. Lyons observes that the question "how much fluid will a filter or funnel of a given diameter hold?" is one which occasionally is important, and one to which text books give no answer. When a circular filter is folded "plain" it fits a funnel of a diameter just one-half that of the filter itself. That is to say, an eight-inch filter, folded plain, will hold exactly as much as a funnel of correct angle (60 degrees) having a diameter of four inches. The capacities of any two filters or funnels, by a well-known law, are in the ratio of the cubes of their diameters. Hence an eight-inch funnel will hold eight times as much as a four-inch one. If, then, the capacity of a 16-inch funnel is known, one can easily deduce that of one of any given diameter. It happens that this capacity is one which can be very easily held in memory. It is very near 32 pints, the corresponding filter having a diameter of 32 inches. It is also not far from 16 liters (actually 15.218), and is, of course, again, approximately four gallons. For those who do not like to waste their gray matter in such exercises, the following tables will be of service:

Capacity of funnel, Cc.	Diameter of funnel,* Cm.	Diameter of funnel,* inches.	Capacity of funnel, Cc.	Diameter of funnel,* Cm.	Diameter of funnel,* inches.
1	1.63	0.64	300	11.0	4.3
2	2.06	0.81	400	12.1	4.8
3	2.37	0.93	500	13.0	5.1
4	2.59	1.02	600	13.8	5.4
5	2.79	1.10	700	14.6	5.7
6	2.97	1.17	800	15.2	6.0
7	3.18	1.23	900	15.8	6.2
8	3.28	1.29	1,000	16.4	6.5
9	3.40	1.34	2,000	20.7	8.1
10	3.53	1.39	3,000	23.7	9.3
15	4.0	1.6	4,000	26.0	10.3
20	4.5	1.8	5,000	28.0	11.0
25	4.8	1.9	6,000	29.8	11.7
30	5.1	2.0	7,000	31.4	12.4
40	5.6	2.2	8,000	32.8	12.9
50	6.0	2.4	9,000	34.0	13.4
60	6.4	2.5	10,000	35.3	13.9
70	6.8	2.7	11,000	36.5	14.4
80	7.1	2.8	12,000	37.5	14.8
90	7.3	2.9	13,000	38.5	15.2
100	7.6	3.0	14,000	39.5	15.6
200	9.6	3.8	15,000	40.4	15.9
			16,000	41.3	16.3

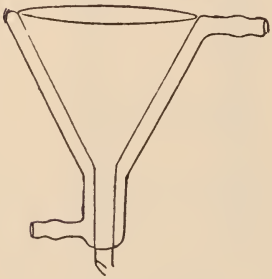
* Or semidiameter of filter.

Capacity of funnel.	Diameter of funnel, inches.	Diameter of funnel, Cm.	Capacity of funnel.	Diameter of funnel, inches.	Diameter of funnel, Cm.
60 min.	1.00	2.54	6 pints.	9.1	23.2
120	1.26	3.20	7	9.6	24.4
180	1.44	3.66	8	10.1	25.6
240	1.58	4.01	9	10.5	26.6
300	1.70	4.32	10	10.8	27.5
360	1.81	4.60	11	11.2	28.4
420	1.91	4.66	12	11.5	29.3
1 fl. oz.	2.0	5.1	13	11.8	30.1
2	2.5	6.4	14	12.1	30.8
3	2.9	7.3	15	12.4	31.5
4	3.2	8.0	16	12.7	32.2
5	3 4	8.7	17	12.9	32.9
6	3.6	9.3	18	13.2	33.5
7	3.8	9.7	19	13.4	34.1
8	4.0	10.1	20	13.7	34.7
9	4.2	10.5	21	13.9	35.3
10	4.3	10.9	22	14.1	35.8
11	4.4	11.3	23	14.3	36.3
12	4.6	11.6	24	14.5	36.9
13	4.7	11.9	25	14.7	37.4
14	4.8	12.2	26	14.9	37.9
15	4.9	12.5	27	15.1	38.3
1 pint.	5.0	12.8	28	15.3	38.8
2	6.3	16.1	29	15.5	39.3
3	7.2	18.4	30	15.6	39.7
4	8.0	20.3	31	15.8	40.1
5	8.6	21.8	32	16.0	40.6

—Amer. Drugg., Dec. 14, 1908, 345.

Filter Funnels—New Jacketed Forms.—Friedrichs has constructed the two new forms of funnels for hot filtrations shown by Figs. 13 and 14. One of these (Fig. 13) is jacketed in the usual manner, but provided with an inflow and outflow tube, for the circulation of either hot water or steam through the jacket; the other (Fig. 14) is surrounded by a vacuum jacket and is provided with a vacuum lid, the inner surface of the funnel as well

FIG. 13.



Filter Funnel.

FIG. 14.

Filter Funnel.

as of the lid being silver plated. This second form is intended particularly for the filtration of hot concentrated solutions of crystallizable substances, to prevent the rapid cooling of the solution and consequent separation of crystals before the filtration is completed, while the accurately fitting vacuum lid prevents the vaporization of volatile solvents.—Pharm. Ztg., liii (1908), No. 100, 989; from Ztschr. f. angew. Chem., 1908, No. 45.

Enameled Filter Funnel—New Form.—O. K. Schmatolla, Berlin, has devised a new and practical form of filter funnels adapted to filtrations on the manufacturer's scale. These funnels are constructed of strong, seamless, white-enameled sheet-metal, in two sizes (42 and 50 Cm. diameter), the details of construction and application being shown by Figs. 15, 16, 17 and 18. The funnel (*A*, Fig. 15) ends in a short rib, to which a section of rubber tube may be attached to conduct the filtrate into a vessel placed at a convenient distance below, the funnel resting securely in a padded tripod, as shown by Fig. 17; or the funnel may rest in a second funnel, of ordinary construction (*B*, Fig. 15), supported by the reversed padded tripod which rests on the shoulder of the receiving vessel, as shown by Fig. 16, in which the filtrate is thus collected directly. The plaited filter (*f*) having been filled, evaporation is prevented by closing

the funnel with the enameled cover (*C*, Fig. 15). To enable the examination of the filtrate during its passage into the receiving vessel, the little glass vessel shown by Fig. 18, which is also supplied, may be interposed

Fig. 15.

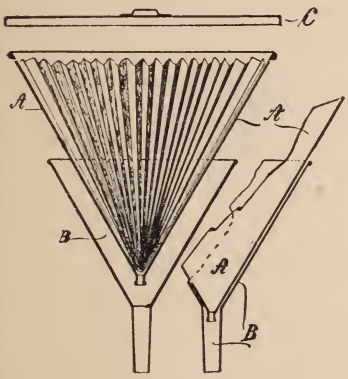


Fig. 16.

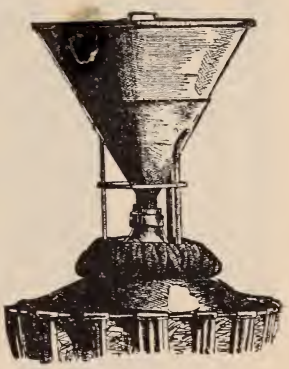


Fig. 17.

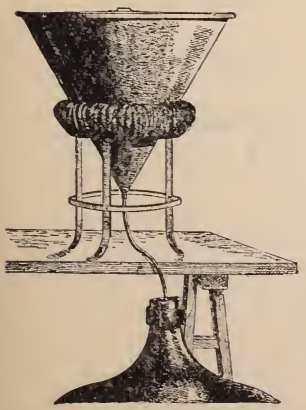
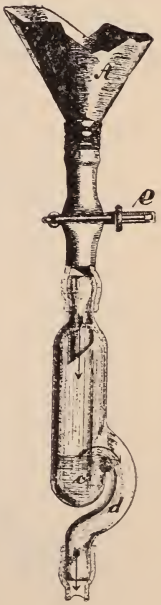


Fig. 18.



Enameled Filter Funnel.

between the funnel and the rubber tube. This retains at *c* a few cubic centimeters of filtrate for convenient inspection, during which the flow of filtrate through *d* may be stopped by means of the clip *e* shown in the cut.

Under circumstances these funnels may also serve well as percolators for the extraction of drugs.—Pharm. Ztg., liv (1909), No. 5, 48–49.

Fig. 19.

Spiral Filter Funnel.

Spiral Filter Funnel—A Useful Device.—Steiner supplies the spiral filter funnel of porcelain shown in the accompanying drawing (Fig. 19), which permits and facilitates rapid filtration through a plain filter-paper, the filtrate flowing off rapidly into the receiving vessel through the channels formed by ribs of the spiral, while the air from the receiver escapes upward in the same way. This permits to fit the neck of the funnel air-tight into that of the receiver, while a well-fitting cover on the funnel prevents loss of volatile liquids by evaporation, not to speak of contamination by dust, etc., from the air.—Pharm. Ztg., liv (1909), No. 46, 452.

Wire Funnel Support—Simple Construction for Small Filtrations.—L. D. Havenhill describes the following simple and inexpensive holder for supporting small funnels up to 10 Cm. in diameter in analytical filtering

Fig. 20.

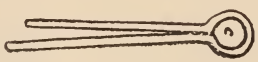
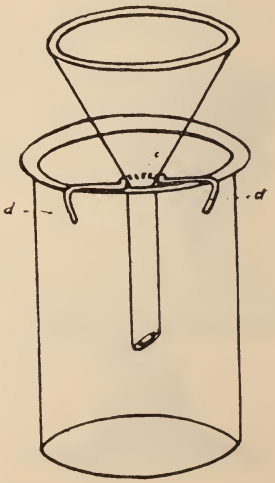


Fig. 21.

Fig. 22.



Wire Funnel Supports.

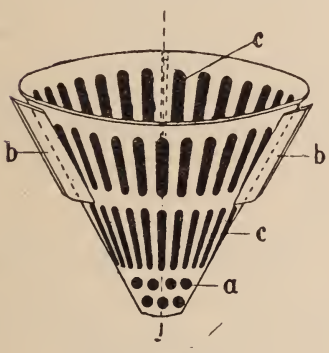
operations: A piece of No. 18 copper wire about 10 Cm. long is bent around the stem of the funnel until it assumes the form of a key (Fig. 20). Then open out the arms of this key and bend the ends downwards and in-

ward, so that they will hook over the top of the beaker or other receiving vessel (Fig. 21). The holder rests on the top of the beaker at the points *a a*. The funnel is supported by the loop *c*, which partially encircles the stem of the funnel and holds it against the inner side of the beaker, as shown in Fig. 22. A sufficient length of wire should be used in forming

FIG. 23.

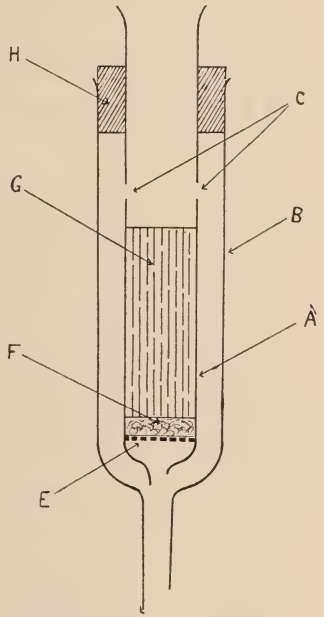
Aluminum Filter Support.

FIG. 24.



Filter Support.

FIG. 25.



Extraction Apparatus.

the hooks *d d*, so that the support cannot fall into the receiving vessel when the funnel is withdrawn.—Chem. News, Febr. 19, 1908, 98; from Journ. Amer. Chem. Soc., xxxi, No. 1.

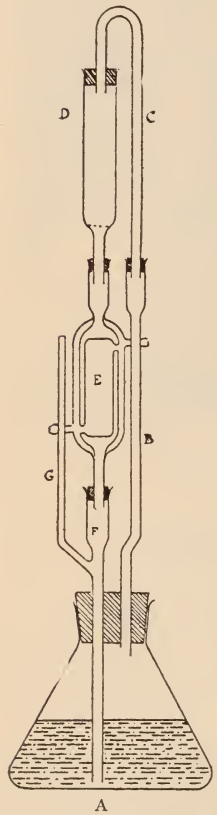
Aluminum Filter Support — Efficient Form.—Ernst Tessler supplies filter supports in different sizes constructed of sheet-aluminum with large sieve-like perforations, which is shown by Fig. 23. To prevent contact with the sides of the funnel and permit the free flow of the filtrate, the supports are provided with a number of bulbous expansions, which determine a space of ½ Cm. between the walls of the two utensils. The perforations are as large as is compatible with the stability of the supports.—Pharm. Ztg., liii (1908), No. 64, 627.

Filter Support—A Cheaper Form.—Robert Hansen has devised the filter support shown by Fig. 24, which is identical in principle with the one above described, but of simpler form and cheaper material. The material is stout sheet-steel, which is well tinned by three successive im-

mersions in the bath after the mechanical construction is completed. The cleats, *b*, *b*, secure a space for the filtrate passing through the elongated openings *c*, *c* and the holes shown at *a* into the neck of the funnel.—Apoth. Ztg., xxiii (1908), No. 72, 652.

Extraction Apparatus—Simple Form for Securing Simultaneous Filtration.—Referring to an apparatus for simultaneously extracting a solid and filtering the solution so obtained, which was shown in illustration and described in the Chemical News (xcvii [1908], 280), Frederick Record mentions the disadvantage of requiring considerable skill in construction, and recommended the simple form shown by Fig. 25 as meeting all requirements, which can be made more readily. The inner tube, *A*, is contracted at the lower extremity, and has a pair of diametrically opposite holes, *C*, in its walls; it is held in position inside the outer tube, *B*, by means of a cork, *H*; *E* is a filter disc which is covered with a layer of filter paper and of asbestos, *F*; *G* is the substance to be extracted. The flask containing the solvent is attached to the lower end of *B*, while a reflux condenser is connected to the upper end of *A*.—Chem. News, Jan. 29, 1909, 53.

FIG. 26.



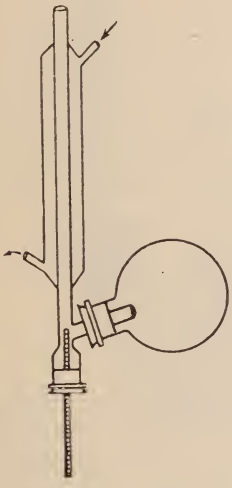
Extraction Apparatus

Continuous Extraction Apparatus — Efficient Form.—Norman L. Gebhard and F. Bryan Thompson describe the continuous apparatus for extracting solids shown by Fig. 26. The extracting liquid is placed in the Erlenmeyer flask *A*, which is fitted with a bi-perforated cork. On boiling the liquid, hot vapors pass up the tube *B* and thence through *C* into the wide tube *D*, which contains the solid substance to be extracted, kept in position by means of a perforated porcelain disc fitted in the constricted part of the tube. The hot vapors in passing through *D* thoroughly extract the substance, and are then condensed in the double-surfaced condenser *E*, whence they return to the flask. For safety purposes a small side-arm, *G*, open to the air, is fused into the adapter *F*, and thus prevents the generation of pressure in the apparatus. If the positions of *D* and *E* are interchanged, the solid in *D* can be extracted by percolation with the cold solvent condensed in *E*. The apparatus is simple, and has been found useful by the authors in many cases.—Chem. News, March 12, 1909, 124.

Reflux Condenser—A Modification of the Liebig Form.—Hahn describes

the condenser shown in its application as a reflux condenser (Fig. 27) and in the ordinary use as a Liebig's condenser, (Fig. 28) which becomes possible by the fusion of a short tube to the condensing tube of ordinary construction forming an obtuse rectangle immediately below the expanded joint, through which in ordinary distillations the vapor is admitted, while in reflux operations the vapor is admitted from the lower,

FIG. 27.



Reflux Condenser.

FIG. 28.

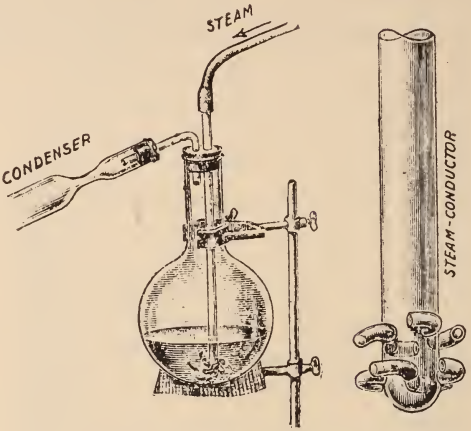
Liebig Condenser.

constricted end of the condensing tube and is condensed before it reaches the exit above.—Pharm. Ztg., liv (1909), No. 46, 452.

Steam Conducting Tube—Efficient Construction.—H. Stoltzenberch describes an efficient steam conductor for direct distillation with steam in small operations, which prevents the bumping and spirting-up of the liquid when the steam is admitted through the full opening of the tubes usually employed. It consists of a straight tube, closed beneath, but provided near the base with a series of small bent tubes, having small orifices through which the steam is injected into the liquid in a fine stream on a horizontal plane. A fine division of the steam is secured, which thus presents a large heating surface and in consequence exerts more energetic action; while the liquid subjected to its action, instead of spirting upward is kept in continuous rotary motion. Moreover, the steam can be admitted more freely, and the process of distillation ended with greater celerity. The rotatory movement of the contents is particularly advantageous in the distillation of resins and volatile oils. The construction of the tube and its application is well shown by Fig. 29. Beside its usefulness for distillations, the steam conductor may serve as a steam stirrer in effecting solutions of salts, for stirring up muddy precipitates, etc., and it

may also be used for the introduction of air under pressure in certain operations.—Apoth. Ztg., xxiii (1908), No. 73, 658.

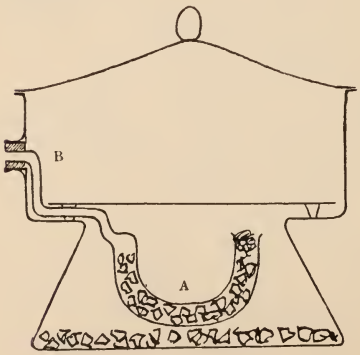
FIG. 29.



Steam Conducting Tube.

Desiccators—Attachment for Equalizing Pressure.—Edwin Dowzard observes that when the contents of the desiccator of the usual form have cooled, after placing hot crucibles or basins therein, a slight vacuum is produced which renders the lid somewhat difficult to remove, and when the

FIG. 30.



Desiccator.

FIG. 31.

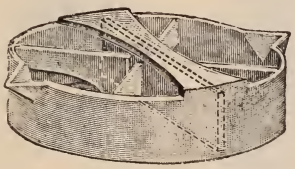
Vacuum Exsiccator.

lid has been removed there is a sudden inrush of air which does uot improve the efficiency of the desiccator. These faults have been remedied by the author in the simple manner by the attachment shown by Fig. 30,

consisting of a calcium chloride U-tube (*A*) to which a section of glass tubing, bent to fit against the inner surface of the desiccator, has been fused. The connection of the U-tube with the outside air is shown at *B* —fitted into the neck by means of a perforated rubber stopper. This permits the escape of the expanded air, while that entering is dried in its passage through the $CaCl_2$ tube. Equilibrium of air pressure is thus maintained throughout the process of desiccation.—Amer. Jour. Pharm., Dec., 1908, 588.

Vacuum Exsiccator—Improved Form.—Kempf describes the improved form of vacuum exsiccator shown by Fig. 31, which possesses some marked advantages over the exsiccator commonly in use. The details are plainly shown in the drawing and require little description. The central shelf is movable, so that it may be adjusted for the reception of beakers or flasks; or the entire rack of shelves may be removed and substituted by the porcelain tray (Fig. 32) ordinarily used in exsiccators for the reception of the drying agent. In the improved apparatus, the drying agent may be contained in ordinary porcelain dishes and placed either in the bottom of the exsiccator or on the top shelf.—Pharm. Ztg., liv (1909), No. 20, 202.

FIG. 32.



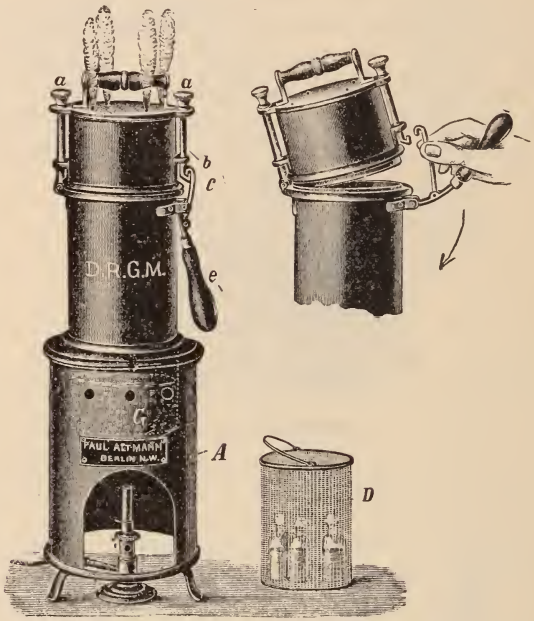
Porcelain Tray.

Sterilization—Methods Adapted to Pharmacy.—Reginald R. Bennett and W. J. Uglow Woolcock give a lucid description of the various methods of sterilization adapted to pharmacy, accompanied by numerous illustrations, exhibiting the apparatus and utensils required for sterilization with hot air, the sterilization of dressings and of fluid preparations, describing also the method of sterilization by filtration, and special methods for preparations which cannot be treated by the ordinary methods. Considerable space is devoted to the sterilization of liquids in "ampuls" (or "ampouls"), which will be profitably consulted by pharmacists who are called upon to supply them. Obviously the details of description cannot find space in this report, and the paper must therefore be consulted in the original, in Pharm. Journ., March 27 and April 10, 1909, pp. 420–422 and 491–493.

Sterilizing Apparatus—Convenient Form for the Prescription-Counter. —Pault Altmann, Berlin, supplies the sterilizing apparatus shown by Fig. 33, which is designed for conveniently sterilizing prescriptions. The

steam-drum *G*, resting in the tripod-mantle *A*, is surmounted by a hood-shaped lid, perforated at the top for the escape of steam, solidly hinged, and easily opened or closed by means of the lever *e*, which grasps the bolt *a*, as shown at *b* and *c* in the drawing. On receipt of a prescription requiring sterilization, about half a liter of water is introduced into the drum and the heat of a Bunsen flame is applied. After the prescription has been compounded it is placed in the wire basket *D*, and this is intro-

FIG. 33.



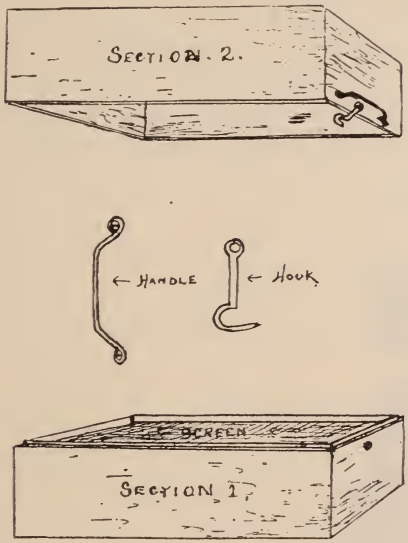
Sterilizing Apparatus.

duced into the drum (where it rests on an inner ledge above the water-line), and the hood being securely closed, the apparatus is left to itself for about half an hour, when the sterilized medicine may be removed by the simple manipulation shown in the drawing.—Pharm. Ztg., liv (1909), No. 20, 201–202.

Powder Mixer—Efficient Construction.—Ernest Sexsmith makes an efficient mixer for baking powders from two shallow wooden boxes ("Tanglefoot" containers), by interposing a wire sieve attached to a wooden frame of such dimensions that it fits into one of the boxes, being held in position so that the frame extends outward one-half its thickness, and thus forming a flange over which the second, inverted, box fits. The two parts are securely held together when in use by flat hooks, and for convenient use the upper section is provided with handles—the complete arrangement being shown by Fig. 34. In use the ingredients, previously

passed through a sieve of suitable fineness, are placed into one of the compartments, and by the well-known method of shaking passed through

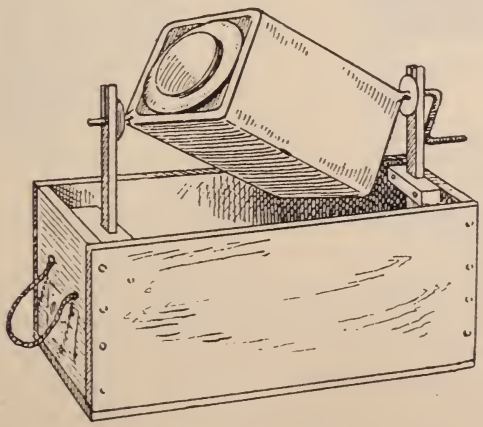
FIG. 34.



Powder Mixer.

the sieve into the opposite compartment—this process of sifting being repeated by reversion 10 or 12 times.—Bull. Pharm., Jan., 1909, 26.

FIG. 35.

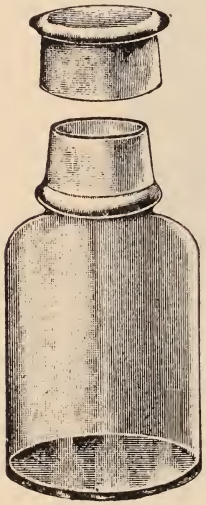


Powder Mixer.

Powder Mixer—An Economical Device.—Isaac M. Weills describes the "Powder Mixer" shown by Fig. 35, which is intended for preparing and

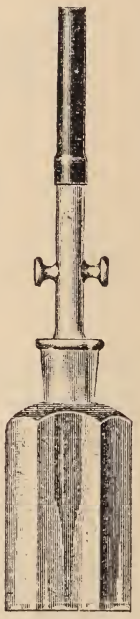
quickly mixing tooth, face and other powders in quantities. The ingredients, previously sifted, are introduced, the lid is screwed on, and the crank is turned slowly, say ten or twelve times, which suffices to thoroughly mix them. It is constructed from an old chocolate can by soldering a piece of five-sixteenth inch thick copper wire on diagonal corners, and on opposite ends of the can, the piece on the one end being bent to form a journal and also a crank, while the piece at the other end acts only as a journal to support the can. The can is then fitted into a wooden packing box, which serves as a support, the journals running in two uprights of

FIG. 36.



Powder Bottle.

FIG. 37.



Eye dropper and Bottle.

equal height fastened to the ends of the box as shown.—Proc. Pa. Pharm. Assoc., 1908, 212.

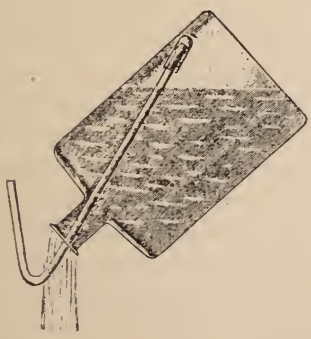
Powder Bottles—Closure with Ground-glass Caps.—C. Becker constructs the powder bottle shown by Fig. 36, which, in contrast with the usual stopper closure, is closed hermetically with a ground-glass cap. The advantages are obvious, not the least of which is the minimized liability of the cap becoming fastened so that it becomes difficult to open the bottle, as is so frequently the case with ordinary ground-glass stoppers. Moreover, this eventuality may be completely prevented by the application of a fatty lubricant, which is not admissible in stoppered containers.—Pharm. Ztg., liv (1909), No. 46, 452.

Eye-dropper and Bottle—Improved Construction.—Breidenbach has devised an improvement in combination eye-dropper and bottle, which consists in sealing two button-like projections on the stem of the stopper-pipette (as shown by Fig. 37), by means of which it may be tied to the neck of the bottle and securely held in place during transportation.—Pharm. Ztg., liii (1908), No. 92, 910.

Brown-glass Bottles—Protection against Light.—J. Brand finds that dark, reddish-brown glass offers the best protection to beer against the destructive action of sunlight. Beer contained in bluish-green bottles is readily altered in taste and smell on exposure to direct sunlight. The permeability of bottles to chemically active rays was determined by filling them with a solution containing 1.2 Gm. of iron-ammonium citrate, 1 Gm. of potassium ferricyanide and 2 Gm. of oxalic acid in a liter. In the blue-green bottles this liquid was turned dark blue after three hours, whereas in the brown bottles it was only colored faintly yellow during the same time.—Pharm. Journ., Sept. 19, 1908, 334; from Chem. Ztg., 1908, *2*, 647.

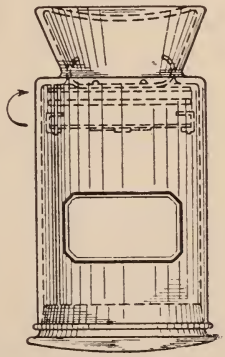
A Simple Device for Insuring a Rapid Flow from Narrow necked Bottles is described by Rebensdorff and illustrated by Fig. 38. In consists of a glass tube reaching to near the bottom of the bottle, the outer portion bent at an angle, the inner orifice loosely covered by a glass capsule, held in place at two points by fusion and of sufficiently greater diam-

FIG. 38.



Narrow-necked Bottle.

FIG. 39.



Container.

eter to permit the admission of air as fast as the liquid contents of the bottle flow out. The utility of the little device is obvious, particularly in cases in which it is desirable to decant a clear liquid from deposits, etc. —Pharm. Ztg., liii (1908), No. 55, 546; from Chem.-Ztg., 1908, No. 53.

Containers for Hygroscopic Drugs—A Practical Device.—Fritz Schantz (Frankfurt a.M.) has devised and supplies the container for hygroscopic vegetable drugs shown by Fig. 39, which is protected by a German patent.

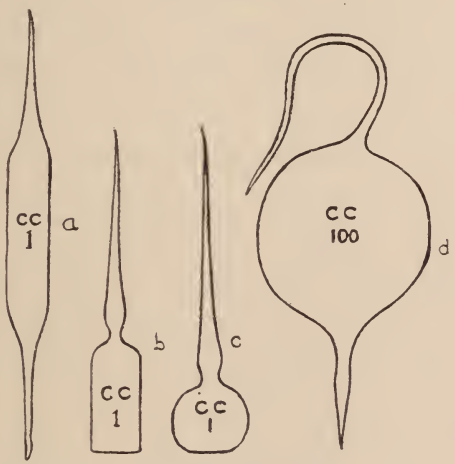
It consists of a glass vessel, closed with a ground-glass stopper, and constricted near the base so as to form a hollow space for the reception of drying agents, such as calcium chloride, soda-lime, etc. This space is separated from the contents of the container by an accurately fitting double sieve, between which a layer of cotton is interposed so that contact between drug and drying material may be effectually prevented, the sieve being securely held in place by a special contrivance not shown in the cut. —Pharm. Ztg., liii (1908), No. 83, 816.

Dosage Forms of Medicines is interestingly discussed by M. I. Wilbert in a paper printed in the "Proceedings" of this Association, 1908, 1061–1065.

Ampoules (Ampuls)—Origin and Advantages.—G. Pégurier contributes a practical paper on the dispensing of "ampoules," in which he successively describes their origin, their advantages, shapes and sizes, quality of glass, the preparation of the solution with which they are filled, the different methods of filling them, the method of sterilization, and the final finishing off. Regarding their origin, the author says that the first ampoules were Pasteur's pipette and sterile flask, which were suggested in the course of his researches on bacteria by a desire to obtain pure cultures by using an absolutely sterile medium, and to preserve these cultures from accidental contamination by extraneous organisms. The flask, as is now well known, was closed by a plug of sterile cotton-wool, and the long neck could be easily sealed by a flame if it were desired to remove the flask to a distance from the place of preparation. A sealed Pasteur flask is really an ampoule, for although it is usual to think of a Pasteur flask as large and to associate smallness with an ampoule, neither has, in fact, such limitations. Thirty years ago Limousin introduced the ampoule as a convenient method of preserving hypodermics, while a paper describing ampoules was published in the "Bull. générale" of the "Société de Thérapeutique" for April, 1886. Both ampoule and its contents were sterilized separately, but since then further advance has taken place, in that the filled ampoule is sterilized in an autoclave, a method which has made the process easier and reduced the cost at which ampoules can be supplied. The use of ampoules is now general in France, Italy and Spain, and they form part of the medical stores of the armies and navies of most nations. Regarding the advantages of ampoules, the author points out the following: (1) The liquid is absolutely aseptic. (2) It can be preserved indefinitely. (3) Ampoules are convenient for the physician and save his time. (4) Liquids but seldom required can be kept ready for an emergency. (5) Any drug can be put up in ampoule form. As regards the shapes and sizes of ampoules, it is not difficult for those who have some practice in glass-blowing to make their own ampoules, but most pharmacists will be content to purchase the empty bulbs, which are

now supplied by makers in France, Germany and Italy, of satisfactory quality, in different shapes, of which typical examples are shown by *A*, *B*, *C* and *D*, Fig. 40. These are either of white or colored (amber) glass, which, as is important, must be neutral—*i. e.*, does not yield alkali or cause turbidity in the solution stored in them. The author's description of the various methods of filling the ampoules is also illustrated by cuts of the apparatus employed, which must be consulted in the original. These embrace the apparatus employed for filling by the vacuum system

FIG. 40.



Ampoule Bulbs.

and by the pressure system, either by inflated rubber bulbs or by atmospheric pressure.—Chem. & Drugg., Jan. 30, 1909, 169–171.

Ampuls—Their Use in the Dispensing of Hypodermic Solutions.—Caswell A. Mayo, at the December meeting of the New York Branch of this Association, read a paper on "Ampuls and their Use in the Dispensing of Hypodermic Solutions, in which he describes in comprehensive detail the history of their introduction for this purpose, gives a description of the different forms in use, the characters of the glass and method of their construction, method of filling them, sterilization before and after filling, and some of the apparatus required for filling them—his information being carefully and clearly presented in the published paper, which is accompanied by a number of cuts illustrating the text. Referring to the original for other details, the following concerning the methods of filling the ampuls, and the apparatus necessary, may here be reproduced verbatim as follows:

The ampuls may be filled by means of (1) a pipette; (2) a burette; (3) a hypodermic syringe; (4) a vacuum created by heating the bulb; (5) a vacuum created by means of ether; (6) or by aspiration with the aid of an Auer apparatus. In the first five processes named the bulbs must be

sterilized *after* filling. In the latter process the sterilization takes place before filling.

1. The tip of an ordinary eye pipette is drawn out by the aid of heat to a capillary tube. The rubber bulb and the pipette itself are sterilized by boiling for half an hour or by means of a steam sterilizer. The sterile hypodermic solution is drawn up into the pipette and the tip of this passed down to the bottom or near the bottom of the bulb, previously sterilized, and the bulb filled nearly full. The ampul is then heated to the point of sterilization, ordinarily 100 degrees C., and the tip sealed while the contents are hot. The tip may either be sealed by rotating it in the point of a Bunsen flame or, preferably, heating it only long enough to soften it and then squeezing the walls together with pincers. Care must be taken to make the seal perfect. The sealed ampul is then put into a solution of methylene blue, about 1 grain to 2 ounces of water, and sterilized by boiling for half an hour, provided the solution will not be injured by boiling, or in a steam sterilizer. If any flaw or imperfection exists in the ampul, its contents will absorb color from the solution of methylene blue; consequently any which are colored should be rejected. The perfect ampuls should be sterilized again after twenty-four hours, either by means of steam or boiling in water. Where the contents of the solution are likely to be decomposed by this temperature, a lower temperature, 60 degrees C., may be used, but to insure sterility, sterilization must in this case be repeated daily for from four to seven days.

2. The point of the burette may be drawn out to a capillary tube, or a hypodermic needle or a fine canula may be fused to the end of the burette, as recommended by one of the German writers on the subject; or a tube, one end of which has been drawn out to a capillary point, may be attached to the burette by means of a rubber tube. This rubber tube has been objected to an account of the difficulty, or alleged impossibility, of sterilizing it. Personally I do not think the objection a valid one, as I believe the subsequent sterilization of the ampuls offers complete protection. This question of sterility of the ampuls filled according to the method named is now under investigation. The remainder of the process is carried out exactly as given above for ampuls filled by means of a pipette.

3. The hypodermic syringe offers an excellent means of filling the ampuls, save for the amount of time required in its use. The syringe should, of course, be sterilized before use. The process is the same as with the pipette.

4. The clean and sterile ampul may be taken up by pincers, the bulb held in boiling water, or over a Bunsen flame, taking care not to get it too hot in the latter case, until a partial vacuum is created by the heat, and the point of the bulb then thrust into the solution when the liquid will be drawn up into the bulb.

5. A drop of ether may be poured into the ampul, which is then held over a flame until the vaporized ether ignites at the tip. The complete evaporization of the ether will be signalized by the extinction of the flame at the tip which should then be thrust into the hypodermic solution which will be drawn up rapidly into the vacuum, so rapidly in fact that care must be taken not to fill the ampul too full. This process is particularly useful in dealing with oily liquids such as are used as a medium for the deep injection of mercury. Then proceed as under paragraph 1.

In all the above methods the process of sterilization must be carried out *after* the bulbs are filled and it does not seem to be essential that the process of filling should itself be carried out with strict regard to asepsis, though at least ordinary care should be taken at every stage of the operation to avoid possible infection with the bacteria always floating in the air. From a bacteriological point of view, however, a process that when properly carried out gives fair assurance of complete sterility is much to be preferred. If it is proposed to do this it will be necessary to heat the bulbs before sealing them, and to fill them by the aid of an aspirator, such as that recently described by Aner, of Zürich, which enables the filling of the ampuls without handling.—Amer. Drugg., Dec. 28, 1908, 279–281.

Supplementary to the preceding paper, Mr. Mayo presented a paper at the February (1909), meeting of the Philadelphia College of Pharmacy, in which he gives much additional and more detailed information concerning the preparation of ampuls by the retail pharmacist and describes a number of special apparatus, which are shown in drawings accompanying the paper. Amer. Drugg., Feb. 22, 1909, 98–102.

Ampoules—Precautions in Filling and Sterilizing.—Kurt Beysen calls attention to two important precautions concerning the filling and sterilization of ampoules, viz.: (1) the careful removal of any substance remaining in the capillary after filling, and (2) a test by which, after the sterilization, the absence of fracture in the finished ampoule may be ascertained. The presence of adhering substances in the capillary interferes with the subsequent seating of the ampoule and results in the carbonization of the adhering substance if it is of organic origin. To remove this, the capillary should be carefully wiped with a trimmed feather dipped into boiling water. To determine the soundness of the finished ampoules, these are to be sterilized in water colored with some suitable coloring-matter, observing that the ampoules be completely submerged during the sterilization and subsequent cooling. In case of fracture, the coloring-matter penetrates to the interior and thus gives evidence of the imperfection. The author also makes some practical suggestions concerning the method of cleaning and preparing the ampoules for filling, and for filling them with liquids of a different nature, such as oils, gelatin solutions, etc.—Pharm. Ztg., liii (1908), No. 87, 859.

Ampuls—Method of Filling and Testing.—Steinbrueck gives a concise

description of the method employed by him in filling ampuls in the Charité Hospital, Berlin. The ampuls, of the shape shown by Fig. 41, are composed of perfectly neutral Jena normal glass, and are supplied by Fridolin Greiner in a very clean condition and with the capillary sealed. Having cut off the superfluous portion of the capillary tube from the required number of ampuls, a scratch is made immediately below the bulb-neck of each by means of a hardened steel knife, a diamond, or a very fine file. The opened ampuls are then subjected to boiling in distilled water, during which they float upon the surface; if then the heat is turned off and some cold distilled water is poured upon the floating ampuls, a partial vacuum is produced in their interior, and they are quickly filled with the water. On now again boiling, the greater part of the water is ejected from the ampuls, the rest being subsequently removed by spirting. If deemed necessary, this process of boiling, etc., may be repeated, but it is usually superfluous.

FIG. 41.

Ampuls.

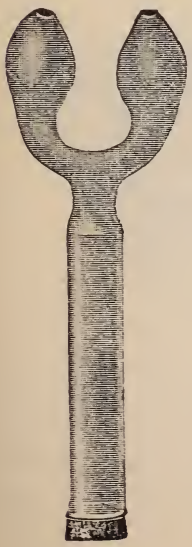
The next step is the filling of the ampuls, a very simple operation, which is accomplished by the aid of a large hypodermic needle attached to a 10 Cc. pipette. The exact quantity or dosage of filtered solution—using however 1.1 Cc. if the quantity does not exceed 1 Cc.—having been introduced, the neck of the ampul is carefully washed out (if necessary) with boiling water by the aid of a trimmed feather; the filled ampul is then warmed and the open end of the capillary exposed to the point of a Bunsen flame, when a few turns will serve to seal the capillary hermetically. The sterilization in the small sterilizing apparatus of the prescription-counter should be continued at least half an hour at a temperature of 100° C.; if at a lower temperature, for a correspondingly longer time, and under circumstances, for a whole day. If this sterilization is effected in water slightly colored, the color will enter into ampuls which have become fractured, and these being easily recognized must be rejected.—Pharm. Ztg., liii (1908), No. 92, 908.

Ampuls—Some Difficulties in Sterilizing.—George P. Forrester, speaking of difficulties encountered in the preparation of ampuls, says that the first difficulty is experienced in obtaining really neutral glass ampuls, and many otherwise excellent Jena glass ampuls will after thirty minutes' sterilization appear quite opaque, to such an extent have they been attacked. In this respect yellow (amber) ampuls appear to be the greatest sufferers, the white glass seeming less susceptible. But the bugbear of the whole question lies in the sterilization of the solution and filling the ampuls under really sterile conditions. The manufacturer of ampuls should have a thorough bacteriological as well as chemical training, for many are the errors committed in much of the so-called sterilization performed. In fact, each individual chemical used must be considered, the temperature it will bear without decomposing and what bacteria are likely to grow in

a solution prepared from it. Further, the characteristics of the solvent must be considered. It is imperative to consider every single solution from every point of view before undertaking to sterilize it. Then, with regard to sterilization, the suitable method depends upon the sum total of the above factors. Some solutions may be sterilized in the autoclave by the dry process, others again by the wet method, and for some sterilization is accomplished by filtering through "candles" of germ-proof porcelain, but this method unfortunately cannot be adopted with oily solvents. Important firms see that in filling the ampuls the whole surroundings are as sterile as possible, and later on make control tests of the solution to see whether it is really sterile. The great difficulty consists in getting rid of the spores, especially of tetanus and allied earth bacilli. Sterilization at one temperature or even the much vaunted method of repeated "fractioned" sterilization, may kill the bacteria, but not the spores, and to effect this all the factors of the case have to be considered.

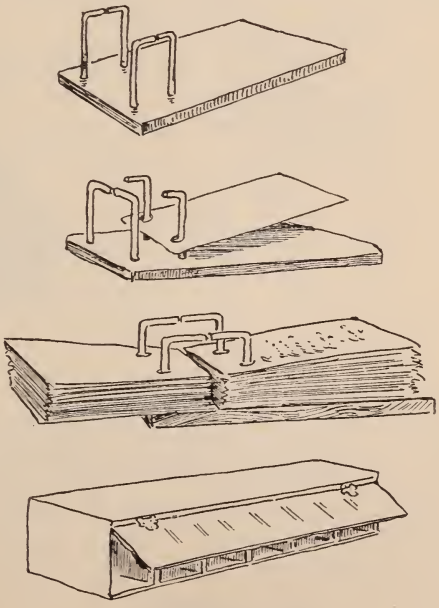
The question of ampuls is by no means an easy one, and, unfortunately, considerable anxiety is experienced in their preparation when this is undertaken really conscientiously, as several accidents have occurred from overlooking this important point.—Amer. Drugg., April 26, 1909, 233.

FIG. 42.



Inhaler.

FIG. 43.



Prescription File.

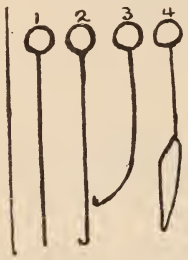
Inhaler—New Form.—The accompanying cut (Fig. 42) shows a new and practical form of inhaler, which is intended particularly for the inhalation of menthol, etc., for the relief of coryza. The hollow stem being

filled with absorbent cotton saturated with the medicament, the pear-shaped nozzles are inserted well up into the nostrils and, the cork having been removed from the nether opening in the stem, the medicament is inhaled through them.—Pharm. Ztg., liii (1908), No. 77, 759.

Prescription File—Home-Made Construction.—A. B. Burrows gives the following directions for making the serviceable prescription file shown in the accompanying drawing (Fig. 43): Order some boards sawed (or do the work yourself), to be ⅜ inch thick and 4¾ x 7½ inches in area, each to serve as the base of a file. Upon this base, at about one and a half inches from the end, screw uprightly two brass hooks shaped as shown. Opposite to these, and in such a way that the ends meet, screw two more hooks of the same size and shape. With the addition of a piece of cardboard to place on top of the filled file—which should hold about 500 prescriptions—this constitutes the entire outfit. The hooks should be placed on the board the same distance apart as are the holes in the ordinary perforating device, which can be bought for a few cents. The lower drawing shows a home-made cabinet for the reception of the files as they accumulate.—Bull. Pharm. Feb., 1909, 67.

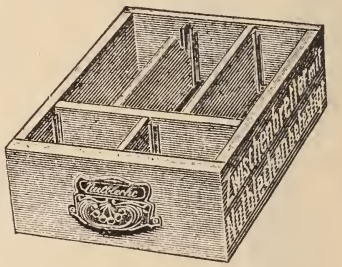
Wire Implements—Useful Suggestions.—Probably few practical pharmacists are unfamiliar with wire devices as aids in various operations of the shop, such as are shown by Fig. 44, but probably quite as few have con-

FIG. 44.



Wire Implements.

FIG. 45.



Drawer.

trived and maintain the systematic number which are here recommended by E. T. Ferté. He says that 10 minutes' time and 10 cents worth of size 10 of spring brass wire will suffice to make these useful implements. Number 1 is used principally for inserting and removing cotton from funnels, percolators, etc.; numbers 2 and 3 for cleaning bottles; number 4 for removing corks from bottles, "which it does before one has time to swear."—Bull. Pharm., Nov., 1908, 470.

Drawers—Adjustable Grooves for Making Divisions.—F. Sakszewsky has introduced adjustable grooves made of tinned iron which serve admirably for dividing drawers into several compartments, as shown in the

accompanying cut (Fig. 45). The grooves are fastened to the sides of the drawer, or its divisions, by means of the spike-like serrations project-

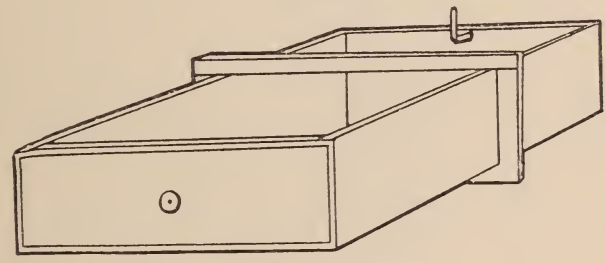
FIG. 46.

Drawer.

ing from their extremities and plainly shown by Fig. 46.—Pharm. Ztg., liii (1908), No. 100, 989.

Drawer Catch—A Convenient Device.—In order to avoid the complete pulling-out of drawers which are hurriedly opened, such as cork drawers for example, E. A. Zahn has adopted the simple device shown by Fig. 47. An ordinary screw hook about two inches long is straightened out and then bent at right angles so that the screw end will be about three-fourths of an inch long. Screw this hook into the back end of the drawer on the inside, and have it sufficiently near the top to allow the end, when it projects upward, to come in contact with the top of the front frame when the

FIG. 47.



Drawer Catch.

drawer is pulled out. To remove the drawer entirely turn the hook down. —Bull. Pharm., May, 1909, 209.

Antiseptic Lunar Caustic Holder—A New Device.—Arnold has devised a caustic holder, the details of which are shown by Figs. 48 and 49. It consists of a slender pencil (*a*) of pure silver provided with a reversible double screw-thread (*a*), by means of which it may be adjusted for use or, when reversed, enclosed in the tubular holder (Fig. 48). The silver pencil, after sterilization in hot water or, better, in a flame, is coated with silver nitrate by dipping it into the oval opening of the tube (*b*) containing the silver nitrate, which has previously been melted in an alcohol or gas flame, the handle (*c*) of this container being composed of non-conducting material so as to facilitate the heating without burning the fingers. When not in use the melting tube, which has only the single

(oval) opening, is introduced into the holder and held securely by the screw-thread, the closed instrument having the appearance shown by

FIG. 48.

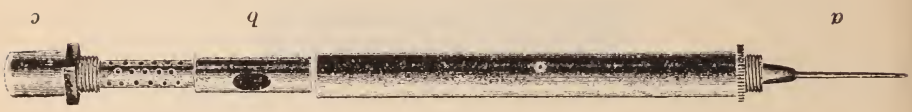


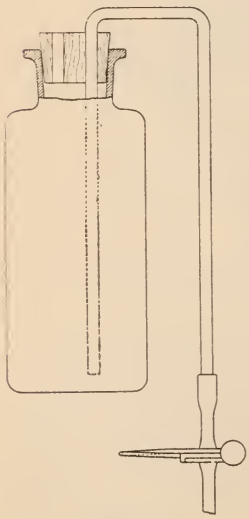
FIG. 49.

Antiseptic Lunar Caustic Holder.

Fig. 49. Complete sterilization of the silver nitrate is reliably and conveniently secured by the use of this holder, which is manufactured by Kirchner & Wilhelm, of Stuttgart.—Pharm. Ztg., liii (1908), No. 100, 988.

Saponaceous Washing Fluid and Container—A Convenient Device.—Professor Scoville has for years used with satisfaction a saponaceous washing fluid for cleaning utensils, made by the formula given below, which he has conveniently kept in the simple container shown by Fig. 50. Any wide-mouth bottle holding 12 or 16 ounces will serve the purpose. This is closed with a bi-perforated stopper, one of the holes being open for the admission of air, the other bearing a syphon tube to the longer limb of which a section of rubber tube, bearing a clamp, is attached. The soap solution is made by dissolving 3¾ ozs. av. of potassium hydroxide (85 per cent.) in about 4 ozs. of water, adding 1 pint of methyl alcohol, and mixing this solution with 1 pint of cottonseed oil. The mixture is warmed until it becomes perfectly clear, and a portion readily dissolves in hot water; then enough water is added to make one gallon. A substitute for this may be made by dissolving one pound of soft soap in three or four pints of hot water and adding a little methyl alcohol. But this is no more economical, and requires quite as long to make.—Bull. Pharm., March, 1909, 120.

FIG. 50.



Container.

B. Preparations.

GENERAL SUBJECTS.

The U. S. Pharmacopœia—General Observations.—Benj. L. Murray contributes some critical observations concerning the pharmacopœial methods, statements and definitions of melting-points and boiling-points; requirements under the purity rubrics, such as statements of not less than such and such a percentage of absolute ingredient, of no, or no appreciable, or no weighable residue; and regarding specific gravities and solubilities—the latter particularly in their relation to the temperature, which, owing to the change from 15° C. to 25° C., has given rise to much confusion. He says that the figures of our Pharmacopœia based on 25° C. are finding their way into the pharmaceutical, medical and chemical literature, *but without the distinguishing 25° attached to them;* so that, when one now sees a specific gravity or solubility stated, doubt always arises as to which temperature forms the basis of the figures. No other branch of chemistry besides U. S. P. chemistry has inclined to the new standard. Apparatus standardized or graduated at 25° C. is practically unknown, and is to be had only at prohibitive prices, because it is all made to order. The Committee of Revision is regarded as having been unwise in making the change and it has already been requested of them that they restore our standards at 15° C.—Pharm. Rev., July, 1908, 193–200.

The United States Pharmacopœia—Suggestions for Improvement.—Geo. M. Beringer, in view of the near approach of the time of the convention for the ninth revision of the United States Pharmacopœia, offers some brief criticisms and suggestions concerning a large number of articles—crude drugs, chemicals and pharmaceutical preparations—in the hope that they may elicit discussion that may be utilized in the next revision.—Proc. N. J. Pharm. Assoc., 1908, 86–94.

The United States Pharmacopœia, VIII.—Frank X. Moerk submits a classification of the quantitative statements of the United States Pharmacopœia, VIII, with comments and suggestions, intended to assist in harmonizing the methods or the expression of results for similar substances in the next revision of that standard, in the Proceedings of this Association, 1908, 890–901.

Preparations of the National Formulary—Corrections.—D. V. Whitney offers some practical suggestions concerning the following preparations of the National Formulary: Elix. gentian. glycerinat., elixir glycyrrhizæ, elix. potass. brom., elix. terpin. hydrat., liq. antisept. alkal., and liq. ferri et mangan. peptonat.—Proc. Mo. Pharm. Assoc., 1908, 103.

Official Extractive Preparations—General Processes.—C. M. Snow advocates the introduction of general processes into the Pharmacopœia

under a description of the various classes of extractive preparations, such as aceta, decocta et infusa, extracta, fluidextracta, tincturæ, etc., as is now being done in all pharmacopœias except that of the United States and the British. The processes may thus be described more in detail, and the worker can more easily become familiar with the important operations involved, comprising digestion, maceration, macero percolation, percolation, concentration of evaporation, etc., than when every operation for every single preparation must be followed, as in our present formulas. It will suffice in most cases to simply refer to the general process, and to omit details of manipulation, except such as may become necessary for special reasons. Thus, general formulas being given for tinctures according to the processes above mentioned, the formula for tincture of benzoin, for example, might simply read as follows:

Benzoin, in No. 40 powder, two hundred. ..... 200 Gm.
Alcohol, sufficient to make one thousand ..... 1000 Cc.
By macero-percolation.

The brevity of this formula, also, would leave space for a brief description of characters, tests for identification, or valuation, as appears in the German, Swiss and French Pharmacopœias. Mr. Snow's paper deserves attention, and may be consulted in Bulletin A. Ph. A., May, 1909, 155–157.

Standard Pharmaceutical Preparations—Some Deteriorations.— H. E. Barnard communicates the results of experiments made with a number of standard pharmaceutical preparations with the object of determining the nature of the change or deterioration when kept as closely as possible under the same conditions of light and temperature as obtained at the ordinary drug store. The preparations were tincture of iodine, lime water, ammonia water and spirit of camphor, which were all carefully made from pure chemicals in accordance with the U. S. P., divided into five equal portions, and stored under the following conditions: One portion was placed in a glass-stoppered bottle and wrapped in black paper; the second in a similar bottle, but not protected from light; the third, also in a similar bottle, but exposed to direct sunlight; a fourth portion was placed in a bottle closed with an ordinary velvet cork; and the final portion was placed in an unstoppered bottle. The results are briefly stated here as follows:

Tincture of Iodine, when freshly prepared, assayed 101.2 per cent. strength, calculated upon a basis of 6.86 Gm. of iodine to 100 Cc. of preparation. The samples were assayed every two weeks. The first four showed no change after two weeks, but the fifth (the open) bottle showed an increase in strength to the amount of 4 per cent., and this increased consecutively until at the end of seven months the iodine content corresponded to 306.0 per cent. U. S. P. In the other four bottles the increase

in strength was trifling even after eight months, when No. 1 assayed 102.3 per cent., Nos. 2 and 3 assayed 103.4 per cent., and No. 4 assayed 103.8 per cent. These four having been tightly corked, it is evident that the increase in strength of No. 5 is due to the vaporization of the alcohol. Except for the greater strength, there was no apparent change in the condition of No. 5.

Spirit of Camphor, prepared by the U. S. P. directions, assayed 98.3 per cent. The experience here was practically the same as with tincture of iodine. In Nos. 1 to 4 there was practically no increase or loss of camphor, while No. 5 showed an increase of 5 per cent. in two weeks, and in subsequent assays, showed rapidly increasing strengths, as indicated in the following percentages: 119 per cent. in 8 weeks, 134.1 per cent. in 12 weeks, 157.5 per cent. in 16 weeks, 185.0 per cent. in 20 weeks, and 259.17 per cent. at the final assay.

Ammonia Water, on the other hand, which initially assayed 11.7 per cent., corresponding to 111.7 per cent. U. S. P. strength, while it deteriorated but slightly in Nos. 1 and 3, and only slightly more in the corked bottle No. 4, deteriorated rapidly in the open bottle No. 5. At the end of two weeks it had lost nearly 50 per cent., in four weeks the ammonia content was reduced to 3.71 per cent., at the end of two months to 1.33 per cent., in 3 months to 0.65 per cent., and at the end of 4 months to 0.36 per cent. At the end of 5 months it showed a strength of only 2.3 per cent. of the U. S. P. strength while No. 1 still showed a strength of 108.4 per cent. and the others very little less—the inferior showing of sample No. 4 (93.8 per cent. of the U. S. P. strength) being due to the action of the ammonia gas on the cork.

Lime Water, prepared by rejecting several washings of the lime with distilled water and final filtration of the saturated solution, was stored in the same manner as the preceding preparations. Nos. 1 to 4 at the end of 6 weeks had lost from 5 to 10 per cent. of the U. S. P. percentage, but No. 5 rapidly lost lime until at the end of this period it retained only 28.8 per cent. of the original percentage. When made according to the U. S. P. and preserved over an excess of lime, with occasional shaking, the strength was slightly increased above the normal.—Pharm. Rev. Oct. and Nov., 1908, 308–313 and 321–326.

Prescription Statistics—An Analysis of 19,000 Prescriptions.—Emerson R. Miller has made a statistical analysis of 1900 prescriptions from the files of four drug stores in different localities of Alabama, and has compiled a table showing the number of times the articles mentioned were prescribed. The dates in two of the files, covering 8,500 prescriptions, do not extend back more than two years; in another, covering 5,000 prescriptions, they extend back to 1905, and of the remaining 5,500 about 3,000 show dates between 1901 and 1905.

The total number of articles prescribed in the 1900 prescriptions is 915. Of these 414 were official (U. S. P.) articles and 30 were N. F. preparations. Calomel was prescribed 2,190 times; sodium salicylate, 1,141 times; quinine, in its various forms, 1,435 times, exclusive of preparations of cinchona; preparations containing pepsin, more than 2,100 times; cascara sagrada, in different preparations, 1,459 times—including "Kasagra" 682 times, but it is significant that the latter occurs 681 times in the prescriptions of one store. Other substances used more than 500 times are: Glycerin, potassium iodide, bismuth subnitrate, phenacetin, salol, sodium bicarbonate, and tincture of nux vomica. Opium and its preparations, including its alkaloids, codeine and morphine, occur 1,302 times.—Proc. Ala. Pharm. Assoc., 1908, 61–70.

AQUÆ.

Bitter Almond Water—Modification of the G. P. IV Process.—Dr. v. Cloedt recommends a modification of the official process for preparing bitter almond water, which secures a larger yield of hydrocyanic acid. The press-cake from the almonds (12 parts) is to be reduced to a coarse (sieve 4) powder and macerated with five times its weight of *distilled* water in the still at the ordinary temperature for 12 hours. The magma is then heated for 3–4 hours to 40°–45° C., when the still is connected with the condenser, and 9 parts of distillate are collected under thorough refrigeration in a receiver containing 3 parts of alcohol, as required by the G. P. IV. The distillation should be slow in the beginning, until 7 parts of distillate have been collected, and should then be forced by passing steam under 2–3 atmospheres pressure through the almond magma until completed. A further quantity of distillate may be collected separately by continuing the heating under pressure. This, containing appreciable quantities of HCN, may be used for the next distillation of bitter almond water which, of course, is adjusted as officially directed.—Pharm. Ztg., liv (1909), No. 24, 242.

Cherry Laurel Water—Content of Uncombined Hydrocyanic Acid.—With the object of excluding cherry laurel water, as well as bitter almond water, made by the admixture of solutions of hydrocyanic acid with water, the G. P., IV,* demand that these waters shall not contain more than one-fifth of the total HCN content in a free state, and gives a method for determining the presence of excessive proportions of free acid. On inquiry, Fleissig ascertained from reputable dealers and manufacturers that it is impractical to prepare cherry laurel water from the drug that will respond to the pharmacopœial requirement, and this is apparently confirmed by

* The German Pharmacopœia, IV, makes no distinction between cherry laurel water and bitter almond water. It says (p. 45): "For *Aqua Lauro-Cerasi* bitter almond water may be dispensed." (Rep.)

the results obtained in an examination of a series of commercial specimens of cherry laurel water, all of which contained HCN only in a free state. The author promises to make direct experiments with fresh leaves, gathered "shortly before the flowering period," as soon as such become available.—Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 3, 33.

Referring to the observations of Fleissig noted in the preceding abstract, K. Siegfried communicates the results of his own experiments, which demonstrate that it is quite possible to obtain from cherry laurel leaves a product conforming to the pharmacopœial requirement, but that under certain conditions the same leaves by (apparently ? Rep.) the same treatment will yield a distillate rich in HCN with much of it combined, while at another time they yield distillates with an inferior content, consisting of free HCN exclusively. The author believes that the condition of the leaves, their comminution and time of standing before the comminuted leaves are distilled, are responsible for the variations observed.—Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 10, 147.

Orange flower Water—Utility as a Perfume and Flavor.—W. G. Greenwalt, having experienced some difficulty in imparting a satisfactory flavor to glycerite of pepsin, tried imported orange flower water, using 4 ounces to the gallon, and found it to be a very acceptable flavor. He has since used orange flower water in a variety of ways, among others as a perfume in place of rose for cold cream and similar preparations. Furthermore, he finds that oil of neroli will answer as well as orange flower water and is very satisfactory.—Proc. Penna. Pharm. Assoc., 1908, 280–281.

Artificial Mineral Waters is the subject of an interesting communication of Enno Sanders, in which he brings forward some pronounced ideas concerning the superiority of artificial over natural mineral waters, in the Proceedings of this Association, 1908, 859–866.

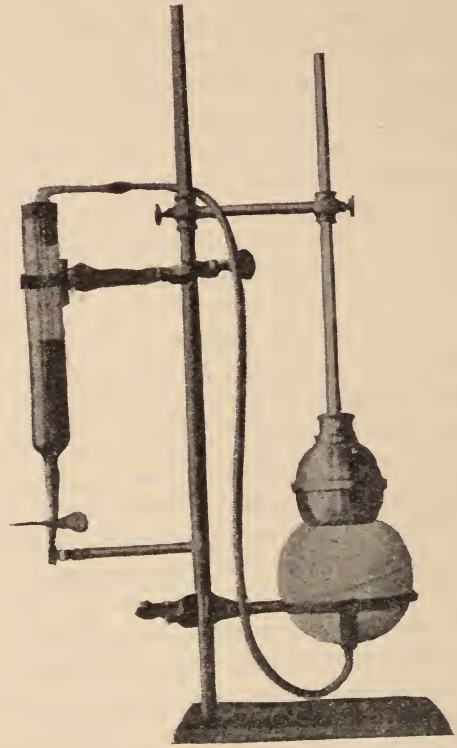
CAPSULÆ.

Gelatin Capsules—Simple Device for Filling by Air Pressure.—A. Duncan calls attention to the simple device, shown in photographic illustration by Fig. 51, for filling gelatin capsules with oily and viscid liquids by the aid of air pressure, which requires but little explanation. A rubber ball forms the air reservoir, which is connected with a glass syringe tube by means of a rubber tube slipped over a short glass tube, bent at right angles and passing through the stopper closing the syringe-tube—the nozzle of the latter being extended by a delivery tube carrying a clip on the rubber joint. Air pressure is exerted by pressing on the plunger resting upon the ball—the expelled air being replaced as required by lifting the stopper in the syringe tube.—Pharm. Journ., Oct. 17, 1908, 486.

Cachets—Method of Sealing Without Moisture.—Kuborn-Lassner has devised and recommends a method of sealing cachets which avoids the

use of moistening. The cachet is filled in the usual way, the upper half

FIG. 51.



Device for Filling Gelatin Capsules by Air Pressure.

is placed over the under, and the sealing is effected by the pressure of a stamp heated by electricity.—Pharm. Ztg., liii (1908), No. 92, 909.

CATAPLASMÆ.

Cataplasm of Kaolin, U. S. P.—Improvement of Formula and Manipulation.—Paul Caldwell finds that the amount of glycerin directed in the official formula for cataplasm of kaolin is too large. It should not exceed 325 Gm. Moreover, the temperature of 100° C. directed in the manipulation is not high enough to convert the glycerin and boric acid into boroglyceride, which, in his opinion, should be produced if a satisfactory preparation is devised. He has found a continuous heat for one hour at 150° C. to be necessary to accomplish this and to drive off all the excess of moisture present in the glycerin. The kaolin, also, should be the commercial kind which has previously been heated or dried. Under these provisions, there is no difficulty to obtain a satisfactory cataplasm, and the subsequent swelling of the mass which otherwise occurs is prevented. In

the practical work on 100 pound lots, after heating the glycerin and boric acid as indicated (so as to form the boroglyceride), Mr. Caldwell adds 25 pounds of clay, which is incorporated by means of a mechanical mixer; after ten or fifteen minutes, 20 pounds more of clay is added; after half an hour 10 pounds more, and after another half hour 5 pounds more of kaolin is sprinkled over the mass slowly as it revolves, and the machine is allowed to run for another hour, adding the oils a few minutes before the machine is stopped.—Drugg. Circ., Nov., 1908, 548.

COLLODION.

Acetone Cantharidal Collodion—Improved Formula.—Geo. M. Beringer communicates the following improved formula for preparing the acetone cantharidal collodion, which he suggested in a paper read before the Association in 1906 (see Proceedings, 1906, 502): Cantharides, in fine powder, 60 Gm.; glacial acetic acid, 5 Cc.; pyroxylin, 4 Gm.; camphor, 1 Gm.; acetone, q. s. Mix the glacial acetic acid with 55 Cc. of acetone and moisten the powdered cantharides with this mixture and set it aside in a closely-covered container for 24 hours. Then pack in a percolator and slowly displace with acetone until exhausted. Reduce the percolate by distillation on a water-bath to 95 Gm., and when cold dissolve in this the pyroxylin and camphor. If necessary make up weight with acetone to 100 Gm.—Proc. N. J. Pharm. Assoc., 1908, 65–67.

Collodion, Salicylated, N. F.—Improved Formula.—Dr. E. H. Squibb suggests the following modification as an improvement on the N. F. formula for salicylated collodion:

Salicylic acid	11 parts.
Fluidextract of cannabis indica, U. S. P.	10 parts.
Contractile collodion, q. s. to make	100 parts.

The substitution of the fluidextract for the solid extract of cannabis indica is simply a matter of convenience, but that of contractile for flexible collodion is preferable because it is more effective.—Bulletin A. Ph. A., Sept., 1908, 280.

ELIXIRIA.

Elixirs of the National Formulary—Criticism.—E. Fullerton Cook communicates the results of a critical examination of National Formulary elixirs, which are based upon actual experiments with commercial products. When difficulties have been met with, it may be that in some instances, at least, minute quantities of foreign substances in the ingredients have caused precipitation in the preparation. Consequently the author promises to conduct further experiments to verify the results reported in the present paper, which may be consulted in the original in Amer. Jour. Pharm. July, 1908, 335–340.

New Elixirs.—Franklin M. Apple communicates and recommends formulas for three new elixirs, viz., elixir dulce, elixir aurantii florum compositum and elixir dulce rubrum, in the "Proceedings" of this Association, 1908, 1026–1027.

Enzyme Elixirs—Formation of Precipitates by Iodides.—Henry C. Blair has observed that precipitates are formed in elixir digestivum comp. and essence of pepsin when used as palatable vehicles for the administration of iodides and bromides. On standing for some time the solutions become darker in color, lose their agreeable odor and taste, and unless shaken before being administered, the patient does not get the proper dose of the ingredients composing the precipitate. It may be that the precipitate contains a particularly active form of iodine or bromine in combination with the enzyme or proteid substance of the elixir, but the chances are that it is only the digestive ingredient, which, we are led to believe, is of practically little or no value. Mr. Blair therefore advises, at the suggestion of a Philadelphia physician, a line of palatable, non-medicinal elixirs to which various flavors and colors are given, to be used as vehicles.—Proc. Penna. Pharm. Assoc., 1907, 264.

Simple Elixir.—Improved manipulation is suggested by Fred. J. Blumenschein in the "Proceedings" of this Association, 1908, 1028–1029.

Elixir Gentian, N. F.—Improved Formula.—Dr. E. H. Squibb suggests the increase in the materials used for detannating to 1½ times the prescribed quantity in the N. F. formula for elixir of gentian.—Bulletin A. Ph. A., Sept., 1908, 280.

Elixir Paraldehyde, N. F.—Slight Increase of Alcohol.—Dr. E. H. Squibb finds that a permanently clear elixir of paraldehyde is obtained if the quantity of alcohol directed in the N. F. (315 Cc.) is increased to 330 Cc.—Bulletin A. Ph. A., 1908, 281.

Elixir Pini et Terpini et Acetomorphinæ, "B. P. C."—Improvements in Formula.—Harold Wyatt suggests that a better preparation may be made by adding the acetomorphine hydrochloride in solution after filtration of the elixir and before making up the prescribed volume. The use of 5 per cent. of concentrated infusion of senega insures the non-precipitation of the oil of pine and the terpin when the elixir is diluted with water on administration. Furthermore, he regards liquid terpinol as being more manageable than the hydrate in all these formulas. It has a pleasant flavor, and is medicinally as effective as the hydrate.—Trans. Brit. Pharm. Conf. (Year book of Pharmacy), 1908, 445.

Elixir of Raspberry—Formula.—Harold Wyatt gives directions for preparing raspberry juice (which see under "Succi"), and from this an elixir, according to the following formula: Tincture of vanilla, 0.25; alcohol, 24.0; tincture of cudbear, 1.0; sugar (granulated), 48.0; raspberry juice, enough to make 100.0. The sugar to be dissolved in the mixed

liquids by percolation.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 447.

Elixir Terpini Hydratis, N. F.—Improved Formula.—Henry C. Blair suggests that the unsatisfactory character of the elixir of terpin hydrate is due to the presence of water. He also considers the flavoring unnecessary, and recommends the following formula, which produces a permanent and acceptable preparation:

Terpin hydrate	128 grains.
Alcohol	8 fl. ozs.
Glycerin, q. s. ad.	16 fl. ozs.

Dissolve the terpin hydrate in the alcohol and add the glycerin.—Proc. Penna. Pharm. Assoc., 1908, 265.

Elixir Terpini Hydratis—Improved Formula.—P. Henry Utech, after considering the different formulas that have been proposed for an acceptable liquid preparation of terpin hydrate, and the difficulties encountered, suggests the following formula for an elixir, which combines a maximum amount of medicament with a minimum of alcohol, permanence, efficacy and superior miscibility:

Dissolve 256 grains of powdered terpin hydrate by the aid of gentle heat in 8 fl. ozs. of alcohol to which 80 minims of acetic acid have been previously added. Then add 2 fl. drachms of tincture of sweet orange peel and 4 fl. ozs. of glycerin, and make up the volume with sufficient aromatic elixir to 16 fl. ozs.—Proc. Penna. Pharm. Assoc., 1908, 277.

Elixir Terpin Hydrate, N. F.—Modification of Formula.—Dr. E. H. Squibb suggests the following modification of the N. F. formula for elixir of terpin hydrate, which overcomes the tendency of the preparation to separate out terpin hydrate when exposed to low temperature:

Terpin hydrate	17.5 Gm.
Tinct. sweet orange peel	10. Cc.
Solution of saccharin	1. Cc.
Alcohol	436. Cc.
Glycerin, q. s.	to make 1000. Cc.

—Bulletin A. Ph. A., Sept., 1908, 280.

EMPLASTRA.

Lead Plaster—Examination of Commercial Samples.—E. F. Harrison and H. E. Watt report the results of their examination of seven commercial samples of lead plaster, undertaken with the object of ascertaining in what respects, if any, the preparations on the market deviated from the B. P. requirement. The results are shown in the following table:

Number of Sample.	Moisture, Percentage.	PbO Percentage.	PbO Percentage on Dry Plaster.	Fatty Acids.			
				Melting-point.	Solidifying-point.	Acid value.	Iodine-number.
				C.	C.		
1...	9.00	30.43	33.44	25°–26°	21.5°	200.6	79.7
2...	2.77	29.27	30.10	28°–29°	24°	200.2	80.6
3...	3.93	31.14	32.41	28°–29°	25.5°	203	80.3
4...	14.48	27.54	32.20	26°–27°	22.5°	201	81.4
5...	11.7	28.07	31.83	25°–26°	21.5°	201	81.3
6...	19.0	26.71	32.97	27°–28°	22°	202	80.0
7...	6.37	30.03	32.07	34°–35°	28.25°	206	85.7

The samples varied in hardness and brittleness, apparently according to age, as the preparation containing 19 per cent. of moisture was brittle, and that with 3.9 per cent. was too soft and sticky to break. The principal variations are seen in the moisture and the lead content calculated on the dry material. The characters of the fatty acids from No. 7 point to its having been made from some oil other than olive oil.—Trans. Brit. Pharm. Conf. (Year-book of Pharm.), 1908, 528–530.

EMULSA.

Emulsions—Critical Review of the Emulsifying Agents in Use.—At the March (1909) meeting of the Baltimore Branch of this Association Mr. H. A. B. Dunning gave the conclusions he had reached as the result of several years experimenting to determine if possible which suspending agent or agents gave the most satisfactory emulsion of fixed oils for extemporaneous use or for keeping purposes. He found that the "Phosphatic" type of emulsion stood long storage the best, and was even when freshly made the most palatable. Acacia produces a very smooth and perfect emulsion, but separation soon takes place. This product he considers the best for extemporaneous use. The proportions of acacia and water directed in the N. F. he found more satisfactory than the proportions generally used, *i. e.*, one fourth as much acacia and one half as much water, as oil. Tragacanth gave the most permanent suspension, but the emulsion was not so smooth as with acacia. Tragacanth should be combined with either acacia or glyconin, as it prevented separation. The use

of twelve grains ot tragacanth in place of dextrin gave a much better N. F. emulsion of cod liver oil with extract malt. Saponin in proportion of 1–16 gr. to the ounce of oil combines the advantages of glyconin, acacia and tragacanth and is therefore the most perfect emulsifying agent, but its use could not be recommended until its medicinal effect is better known. Irish moss emulsions were smooth and white but not so desirable as the acacia emulsion. Dextrin emulsions were unsatisfactory in almost every respect. Ten per cent. alcohol, eight minims of solution of potassium hydroxide to the ounce. and sufficient salicylic acid to saturate the aqueous portion of the emulsion, were used as preservatives, but all the above mentioned emulsions became unusuable after storage for some time, either through oxidation, fermentation with the development of a sour taste or excessive separation although the "Phosphatic" type was found to stand storage best. Acacia emulsion became sour more readily if syrup was present. It was the sense of the meeting that no official emulsions of cod liver oil, castor oil, or petroleum should be kept for more than four days before use.—Bulletin A. Ph. A., April, 1909, 126.

Emulsions.—Frank R. Eldred and W. C. Bartholomew communicate some notes on the separation of oil emulsions, prepared with different emulsifying agents for analysis, in the "Proceedings" of this Association, 1908, 839–841.

Emulsion of Cod-liver Oil—New Formula.—Dr. B. Börner, after pointing out the conditions on which the production of a good emulsion of cod-liver oil depends, suggests the following formula and manipulation:

420 Gm. cod-liver oil, 12 Gm. gum arabic, and 12 Gm. tragacanth are mixed together.

12 Gm. calcium hypophosphite and 6 Gm. sodium hypophosphite are dissolved in a boiling-hot mixture of 300 Gm. decoction of Irish moss (1 : 100) and 100 Gm. glycerin, and the hot solution is added to the cod-liver oil mixture so that the tragacanth may swell at once and not gradually.

When this mixture has completely cooled, a mixture of 150 Gm. lime water and 33 Gm. aromatic spirit (prepared as below) is added gradually, and the emulsion is then completed by beating, *for a very short time*, either with the hand or in a mechanical mixer. The

Spiritus aromaticus pro emulsione directed in the above formula is prepared by the following formula: Oil of bitter almond, free from HCN, 2.5; oil of wintergreen, 2.5; oil of cassia, 2.5; saccharin (90 per cent.), 2.0; vanillin, 0.4; dried sodium carbonate, 0.3; alcohol, 330.0 Gm.

Dr. Börner lays particular stress on the avoidance of prolonged beating of the emulsion, whereby the decomposition of the oil by unnecessary exposure to air is avoided. Perfect emulsification results if the directions above given are carefully followed.—Apoth.-Ztg., xxiv (1909), No. 24, 211.

EXTRACTA.

Solid Extracts of the U. S. P.—Relation of Drug to Product.—Prof. W. M. Searby classifies the solid extracts, numerically, according to the relation of the drug to the finished product as follows:

Standardized for alkaloidal content	8
Reduced to 10 times the strength of the drug	1
Reduced to 8 times the strength of the drug	1
Reduced to 4 times the strength of the drug	4
Reduced to dryness without regard to weight	5
Reduced to pilular consistence	7
Reduced to syrupy consistence	1
No process (commercial product)	1
Total number of solid extracts U. S. P.	28

—Pacif. Pharm., July, 1908, 119.

Solid Extracts—Conservation of Glucosidal Constituents during Preparation.—L. Rosenthaler and R. Mayer have experimented to determine the question whether the glucosides of drugs are liable to be decomposed during the usual methods of preparing extracts from them, and, if so, whether, and to what extent, this decomposition may be obviated by improved methods of preparation. Having demonstrated by experiments with a number of drugs that their glucosidal constituents suffer more or less decomposition under the conditions mentioned, and assuming that this decomposition is due either to the action of acids or of enzymes contained in the drug, the authors tried the effect of preliminary treatment of the drug with boiling alcohol and calcium carbonate, or the simple addition of calcium carbonate to the menstruum, the latter serving to neutralize the acid constituents of the drug, whilst the enzymes are destroyed by the boiling alcohol. The results are exemplified as follows:

Extr. Gentianæ.—Prepared by the G. P. method it yielded 2.2 per cent. of glucosides; when treated with calcium carbonate it yielded 2.38 per cent., and treated with boiling alcohol 2.78 per cent. of glucosides.

Extr. Centaurii.—Preliminary treatment with calcium carbonate had no apparent effect, while treatment with boiling alcohol was even injurious; but these results must be accepted provisionally, since our knowledge of the active constituents of the drug is very incomplete.

Extr. Frangulæ.—Both calcium carbonate and boiling alcohol were apparently without favorable effect; but the authors consider it possible that the enzyme had already been destroyed in the drug employed.

Extr. Sagradæ.—Treatment with calcium carbonate had no effect, the yield of oxymethylanthraquinone (0.26 per cent.) being identical with that in the extract prepared by the official process. The preliminary treatment with alcohol was, however, very effective, the resulting extract yielding 0.44 per cent. of oxymethylanthraquinone.

Extr. Rhei.—Calcium carbonate was here also without effect, but treatment with boiling alcohol increased the yield of oxymethylanthraquinone from 1.17 per cent. to 2.81 per cent., or more than double that contained in the extract prepared by the official method.

These results, which have been confirmed by a series of control experiments, show conclusively that calcium carbonate has no noteworthy effect, either injurious or otherwise, on the glucosides of the drugs named; but, that preliminary treatment with boiling alcohol, while disadvantageous in the case of extr. centaurii, is decidedly to be recommended for the preparation of the extracts of gentian, cascara sagrada and rhubarb.—Arch. d. Pharm., *247* (1909), No. 1, 28–49.

Alkaloidal Solid Extracts—Moisture Cause of Loss of Strength.—J. Friscotel observes that it has been shown that soft extracts show a gradual diminution in their alkaloidal content. This appears to be due to the presence of the moisture, for dry extracts of aconite root, aconite leaf, belladonna root, henbane seed, stramonium seed, conium fruit, and opium retained their alkaloids unchanged, whereas the same extracts in the soft state showed a gradual loss. This is an additional reason for preferring dry extracts to moist.—Pharm. Journ., May 8, 1909, 611; from Bull. d. Sci. Pharm., *16*, 687.

Alkaloidal Extracts—Stability.—M. H. Webster, in view of the often expressed opinion that solid and fluid extracts of potent drugs gradually undergo changes which impair their virtues, has from time to time, during a period of nearly two years, assayed a number of preparations which admit of chemical analysis, and now communicates his results in the form of two tabulated statements, the one embracing fluid and solid extracts of recent and known manufacture, the other a number of preparations made from five to twenty years ago. In the former case, including preparations of belladonna (root and leaf), colchicum (seed and corm), conium leaf, hyoscyamus, ipecac, nux vomica, pilocarpus, stramonium, aconite root and coca, the results were quite satisfactory. In most preparations there was no loss in alkaloid at all during the period of two years, and the loss in no case exceeded 2 per cent. of the total, and was therefore not beyond the limits of experimental error. In the case of the older preparations, the loss during the past two years was also insignificant, although the absence of data regarding the original strength, leaves these results in doubt. It is clear, however, that alkaloidal extracts possess greater stability than is generally conceded.—Chem. & Drugg., July 25, 1908, 172.

Green Plant Extracts—Microscopical Identification.—Henry G. Greenish and R. Elliott Griffiths report the results of experiments undertaken for the purpose of ascertaining the practicability of identifying green plant extracts by a microscopic method of examination. The extracts selected for examination were those of belladonna, henbane, lettuce, foxglove,

hemlock and aconite. It was found that the success of the examination chiefly depended upon (*a*) the concentration of the vegetable *débris* present into a small bulk, and (*b*) the removal of amorphous and colored substances that obscured the details of the tissues. The following is the general method adopted, which, however, had to be modified as circumstances indicated: 0.2 Gm. of the extract was triturated in a mortar with 5 Cc. of water; the turbid liquid was transferred to a conical centrifuge tube, and centrifuged about 2 minutes. The supernatant liquid which was still turbid was poured off, and the deposit stirred up—if necessary with water, and again centrifuged. It was then mixed with chloral hydrate solution (5 of chloral hydrate dissolved in 2 of water) and once more centrifuged. The final deposit was mixed with one or two drops of chloral hydrate solution or glycerin, and small quantities transferred by means of a small pipette to a slide for microscopic examination. Referring to the original paper for the details of the experiments made and the results obtained, it may be said in general that the results of the examination show that not only can, in most cases, the green extracts examined be identified, but that information concerning them may be obtained from the investigation of the *débris* present that cannot be obtained by other means. The paper is illustrated by a number of cuts showing the microscopic elements recognized in the different extracts as well as foreign objects found in them.—Pharm. Journ., Dec. 26, 1908, 834–837.

Solanaceous Extracts—Retrogression of Alkaloidal Content.—A reexamination of a number of solanaceous extracts after four years by Ribaut confirms the observation frequently made before that their alkaloidal content is materially diminished by age. The retrogression from the original content expressed in percentages, observed in the present experiments, was as follows:

Extract. fol. belladonnæ: 3, 45, 22 and 8 per cent.

Extract. fol. hyoscyami: 69 per cent.

Extract. fol. stramonii: 31 and 8 per cent.

Extract. rad. belladonnæ: 4, 3, 1 and 12 per cent.

Extract. sem. hyoscyami: 25 and 24 per cent.

In these calculations a proper allowance was made for possible variations in water content. The author believes these retrogressions to be due, not to chemical decomposition, but to biological processes, incited possibly by bacterial activity.—Pharm. Ztg., liii (1908), No. 89, 880; from Bull. des. Sc. Pharmacol., 1908, No. 9.

Extracts of Belladonna and Hyoscyamus—Assay and Alkaloidal Strengths.—Shortly after the appearance of the G. P., IV, it was pointed out by E. Merck (1900) that the pharmacopœial method for the assay of the mydriatic alkaloids in the extracts of belladonna and hyoscyamus gave results which were too high by 20 to 50 per cent. It was experimentally

demonstrated that this was due to the incomplete elimination of the volatile bases associated with the mydriatic alkaloids by the simple direction to evaporate the chloroformic solution of the total alkaloid to one-half its volume; and since evaporation of the chloroformic solution to dryness was considered inexpedient on account of the possible decomposition of the chloroform, it was proposed by Merck to use ether in place of chloroform for the extraction and to evaporate the ether solution to complete dryness. Comparative experiments instituted by E. Rupp during recent years with both methods not only confirm the observations of Merck that the true pharmacological value of these extracts cannot be determined by the official (G. P.) method, but that it is desirable to redissolve the alkaloidal residues of evaporation several times successively in small quantities of ether and re-evaporate to dryness so as to eliminate the inactive volatile alkaloids completely. This is, moreover, recognized in the new revision of the Swiss Pharmacopœia, which gives results that are still lower than those obtained by Merck's modification. In a series of experiments made with the three methods the average yields were as follows: G. P., IV, 0.9–1.1 per cent.; E. Merck, 0.62–0.7 per cent.; Swiss P., 0.57–0.61 per cent. The author recommends some slight modification of the Swiss method, in which he gives preference to iodeosine over hematoxylin as indicator. As a further result of these investigations, Rupp agrees with E. Merck that the alkaloidal value of extract of belladonna should be given as 1 per cent. and of extract of hyoscyamus 0.5 per cent., not 1.5 per cent. and 0.3 per cent., respectively, now demanded.—Pharm. Ztg., liii (1908), No. 75, 737–738.

Extractum Hyoscyami, Pharm. Helv. IV—Objection to Hœmatoxylin as Indicator in the Alkaloidal Titration.—In a criticism on the method of titration prescribed in the Swiss Pharmacopœia IV for the estimation of alkaloid in extract of henbane, W. Weitbrecht objects to the use of hæmatoxylin as indicator on the ground that the color change is not sharply defined. He recommends instead the use of iodeosine, which, as shown in the experimental data published, produces sharply defined color changes, and yields concordant results.—Schweiz. Wschr. f. Pharm. u. Chem., xlvi (1908), No. 31, 483.

Extract of Opium—Sterilization.—Candussio regards the precipitate produced during the sterilization of solutions of extract of opium to be due to the alkalinity of the glass, and have no influence on the activity of the preparation. His experiments have determined the morphine content to be the same before and after the sterilization. The precipitate adhering very firmly to the walls of the container, the author recommends that the vials for the reception and preservation of the solution be sterilized along with the latter, and immediately after completion transferred to them.—Pharm. Ztg., liv (1909), No. 4, 38; from Pharm. Post., 1908, No. 96.

Malt Extract and Malt—Determination of Diastasic Power.—C. J. Lintner and Chr. Wirth find that soluble potato starch forms the best medium for testing the diastasic power of malt, and the most suitable temperature for the experiments is 20° C. The following procedure is recommended: Malt extract should be prepared by digesting 25 grains of malt for six hours at the ordinary temperature with 500 Cc. of water. Two, 4, or 8 Cc. of the clear filtrate should be employed, according as the malt is green, light, or dark. 100 Cc. of a 2 per cent neutral starch solution are mixed in a flask of 150 Cc. capacity with the requisite amount of malt extract and left for half an hour at 10° C.; 10 Cc. of $\frac{N}{10}$ sodium hydroxide are then added, and the volume is made up to 150 Cc. by distilled water. The maltose is thereupon titrated by means of Fehling's solution. The diastasic power is expressed by the number of grammes of maltose yielded by 100 Gms. of malt; the value varies for light malts between 159 and 343, and for dark ones between 67.7 and 92.9, calculated on the dried solid.—Pharm. Journ., June 12, 1909, 795; from Ztschr. Ges. Brauwesen, *31* (1908), 421–425.

Malt Extract—Importance of a Test on an International Basis.—Dr. Max Hamburg states that only such malt extracts should be employed in medicine which are made from malt alone and which show diastasic activity. The latter should be ascertained by noting the action of the malt extract on starch paste. Malt extract is often adulterated and it is not easy to detect the adulterants. An important guide is the amount of "non reducing nitrogen-free extract." The amount of water is first ascertained, then the reducing sugar (as maltose), and finally the albuminoid compound ($N \times 6.25$). The maltose and albuminoid substance are added together and deducted from the amount of the dry extract, the difference being the "non-reducing nitrogen-free extract." A series of pure extracts examined by the author and E. F. Harrison yielded from 8.2 to 20.74 per cent. nitrogen-free extract. If the amount fall below this or be entirely absent, adulteration with monosaccharide substances may be considered to be definitely established. If there is excess of nitrogen-free extract the presence of cane or beet sugar is indicated. The author expresses the hope that the methods of testing malt extracts might be agreed upon on an international basis.—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem. & Drugg., June 5, 1909, 883.

Malt Extract—Diastasic Valuation.—After reviewing the various tests for estimating the diastasic power of malt extract, E. F. Harrison recommends the following method: Prepare a mucilage containing 1 Gm. of anhydrous potato starch in 80 Cc., cool to 46° C., and add 0.2 Gm. of malt extract dissolved in 20 Cc. of cold water; keep the liquid at 40° C. for exactly one-half an hour, and then immediately stop further conversion by boiling. After cooling and adjustment to 100 Cc., the maltose is de-

termined in this solution by titration, and the diastasic power, expressed as percentage of starch converted, is arrived at by the use of a simple formula, as follows:

$$\text{Diastasic value} = 592\left(\frac{8.05}{n} - \frac{1.61}{m}\right)$$

where n is the number of Cc. of the solution, after digestion, etc., required to reduce 10 Cc. of Fehling's solution, and m is the number of Cc. of a 1 per cent. solution of the original (untreated) extract to perform the same reduction. The amount of malt extract to be used in carrying out the test must be reduced, however, if it is apparent that it is capable of converting more starch than is prescribed in the test. It is a good rule to repeat the test with only one-half the quantity of malt extract (= 0.1 Gm.), using all other proportions in the same way, if the diastasic value is over 250. Then, also, the calculation must be modified by changing the formula so as to read:

$$\text{Diastasic value} = 2 \times 592\left(\frac{8.05}{n} - \frac{1.61}{2\,m}\right);$$

and, again, if a value of over 750 be found by the latter, the amount of malt extract is reduced to 0.5 Gm., and the reading of the formula changed to:

$$\text{Diastasic value} = 4 \times 592\left(\frac{8.05}{n} - \frac{1.61}{4\,m}\right),$$

this allowing for values up to 2000 being recorded. In all cases it is best to determine m after keeping the solution at 40° C. for half an hour, as the amount of maltose is sometimes thereby slightly increased. The author's object in reducing the quantities of malt extract in proportion to its greater strength is to permit the diastase, whatever its amount, to act on the starch under fairly similar conditions.—Pharm. Journ., March 20, 1909, 388–390.

Beef Extracts—Composition.—Henry A. Bradshaw says that, while beef preparations as prepared for the market are supposedly made by the extraction from fresh meat by some process whereby its constituents are obtained in a soluble and concentrated form and the indigestible portions are rejected, information from a reliable source reveals the fact that the makers of these so-called pure extracts of meat use for this purpose what is known to the meat packers as "corn beef cookings." The brine, or "extract" from these cookings is concentrated and packed in attractive containers and sold to the trade as a pure and wholesome extract of beef. According to the standard adopted by the Association of State and National Food and Dairy Departments, meat extract is the product obtained by extracting fresh meat with boiling water, and concentrating the liquid portion by evaporation after the removal of the fat, and it con-

tains not less than 75 per cent. of total solids of which not over 27 per cent. is ash, not over 12 per cent. is sodium chloride, and not less than 8 per cent. is nitrogen. The author, together with Professor Chas. H. La Wall has analyzed three commercial extracts of beef, one so-called fluidextract, and two bouillons, and gives the results in a table, which must be consulted in the original. A summary of these analyses shows, however, excessive ash and sodium chloride, deficiency in nitrogen and the presence of comparatively large percentages of *potassium nitrate*, in most cases, as much as 1.5 to 2 per cent. being present in several of them—the variations probably depending on the addition of more or less pure extract to the corn beef cookings."—Proc. Penna. Pharm. Assoc., 1908, 254–255.

FLUIDEXTRACTS.

Pharmacopœial Fluidextracts—Inconsistencies.—Prof. H. M. Searby observes that pharmacists have always been taught that a cubic centimeter of a fluidextract represented a gramme of the drug, or that approximately a minim represented a grain. There has been no deviation from this relation between drug and fluidextract until the eighth revision of the United States Pharmacopœia was issued. Then, without explanation of the reason why this was done, ten fluidextracts are directed to be made from 6 to 20 per cent. weaker than the drugs, that is, a cubic centimeter of the fluidextract represents 0.8 Gm. to (approximately) 0.94 Gm. of the drug. These are all alkaloidal drugs, the drug in each case being required to contain a certain percentage of alkaloid or alkaloids. The fluidextracts are also required to be standardized, so that 1000 Gm. of the drug, instead of yielding 1000 Cc. of fluidextract, yields an indefinite quantity, determined by the amount of alkaloid present.—Pacif. Pharm., July, 1908, 117.

Official Fluidextracts—Conservatism in Revision.—Francis Hemm discusses the marked changes in composition or working processes of several official fluidextracts. Formulæ in the Pharmacopœia ought to be conservatively revised, and only grievous reasons should demand an upset of a well-tried and satisfactory formula. The removal of working processes summarily, or complicating processes, which before were simpler and satisfactory, is a step which must strike the average pharmacist unfavorably. As instances in which radical changes have been made at the last revision, the author mentions and criticises the formulas for the fluidextracts of licorice, of senna, and of squills.—Proc. Mo. Pharm. Assoc., 1908, 83–85.

The Acetic Acid Fluidextracts of the U. S. P., VIII, are critically reviewed in a paper by Joseph Feil, printed in the Proceedings of this Association, 1908, 883–884.

Fluidextracts—Rational Method of Preparation.—Rosenthaler observes that while it is customary to continue the percolation in the preparation

of fluidextracts until the percolate passes colorless, it has long been pointed out that this prolonged treatment is inexpedient if the drug contains along with readily soluble active constituents, sparingly soluble inactive and colored components. On the other hand, if the inactive and colored components are more readily soluble than the active colorless constituents, the drug may not be perfectly exhausted under the provision mentioned. Assuming that it is not difficult to designate some general or special reactions to determine the absence of active constituents in the percolates of the majority of drugs, the author suggests the application of such from time to time to the percolate as being a more rational method for determining the completion of the process. Thus, with astringent drugs the reaction of ferric chloride with tannin and with alkaloidal drugs the general alkaloidal precipitants would be available. Percolates from glucosidal drugs may be hydrolized and the product of the hydrolysis examined, in case there is no direct reaction of the glucoside available. For example, the percolates from drugs containing oxymethylanthraquinone may be examined by boiling a small portion with 5 per cent. of diluted sulphuric acid under a reflux condenser, shaking out the cooled product of the hydrolysis with ether, and the ether with solution of alkali hydroxide, which becomes red as long as the percolate tested contains an anthraglucoside.—Pharm. Ztg., liv (1909), No. 28, 279; from Südd. Apoth.-Ztg., 1909, No. 22.

Fluidextracts—Examination of Commercial Samples.—Dr. Julius Feldhaus has determined the specific gravities and amounts of residues of evaporation of thirty different fluidextracts, each in several samples from different manufacturers. The tabulated results give evidence of great variation in these preparations as supplied in Germany, both as regards their specific gravities (uniformly taken at 15° C.) and extract residue—the latter being in extreme differences probably due to the amount of glycerin employed as menstruum or preservative. In the absence of information regarding the composition of the menstruum employed, the figures recorded are of doubtful value, although they may serve to establish the presence or absence of glycerin, since fluidextracts containing glycerin yield no completely dry, but usually more or less thick-liquid, residues of evaporation.—Pharm. Ztg., liv (1909), No. 6, 57–58.

Liquid Extract of Cascara—Modification of B. P. Process.—F. Goldby recommends the following modified formula and process for preparing liquid extract of cascara, B. P., which he has used with uniformly satisfactory results, whereas commercial samples have been found to vary considerably in their properties and strength: Moisten 100. cascara, in No. 20 powder, with 75. of distilled water, set aside for six hours, then pack in a percolator, and pour on distilled water until the fluid begins to drop from the percolator; then close the percolator, and allow it to remain closed for twelve hours, after which percolation is allowed to proceed at

the rate of from 40 to 60 drops per minute. Reserve the first 25. of percolate, which will be heavily charged with extractives, and should have a specific gravity of 1.09–1.10. Continue the percolation until the bark is exhausted, evaporate the second portion of the percolate to 37.5, add the reserved portion, then 10. (by volume) of glycerin previously mixed with 20. of 90 per cent. alcohol, and finally bring the volume to 100 with sufficient distilled water. If it is advisable to adhere strictly to the B. P., the glycerin may be omitted. Two batches recently prepared had respectively the specific gravities of 1.072 and 1.078, and yielded 26 and 28 per cent. of dry extract, estimated by weight, not w/v.—Pharm. Journ., Dec. 26, 1908, 838.

Tasteless Liquid Extract of Cascara Sagrada—New Formula.—Ernest Quant recommends the following formula for a liquid extract of cascara sagrada in which, by using magnesium hydroxide instead of calcined magnesia, the quantity of magnesia can be reduced to one-fifth, the drying of the mixture of magnesia and bark is avoided, and the extraction is effected without the use of alcohol: Twenty ounces of cascara sagrada, in No. 20 powder, are mixed with 16 fl. ozs. of solution (sic) of magnesium hydroxide, 24 grains per fluidounce, and 4 fl. ozs. of glycerin; set the mixture aside for three days, then place in a percolator; exhaust with water, evaporate the percolate to 16 fl. ozs., and when cold add 4 fl. ozs. of alcohol, and water, if necessary, to make the volume measure twenty fluidounces. The product possesses a faintly acid reaction, and the persistent bitter taste is just sufficiently eliminated.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1908, 519–521.

Fluidextracts of Rhamnus Frangula and R. Purshiana—Examination of Commercial Samples.—Ludwig Kröber has examined commercial samples of fluidextracts of cascara sagrada and of frangula, and compared the results with preparations of his own make. *Fluidextract of frangula* prepared by the formula of the Pharm. Helv., had the sp. gr. 1.051, yielded 22.35 per cent. of dry extract, and 0.5 per cent. of ash. Ten commercial specimens showed specific gravities from 1.004–1.051; dry extract, 10.32 to 22.35 per cent.; mineral substances, 0.34 to 0.82 per cent. *Fluidextract of cascara*, prepared by the author, had the sp. gr. 1.079, yielded 28 per cent. dry extract, and 1.016 per cent. mineral substances. Ten commercial samples had specific gravities from 1.017 to 1.079, yielded 12.60 to 28.12 per cent. dry extract, and 0.5 to 1.156 per cent. ash.—Apoth. Ztg., xxiv (1909), No. 34, 307–308.

FLUIDGLYCERATES.

Fluidglycerates, a new class of pharmaceutical preparations, are recommended by Geo. M. Beringer, and over 80 formulas from as many different drugs are given in the "Proceedings" of this Association, 1908, 981–1006.

Fluidglycerates of Digitalis and Ergot—Physiological Action.—Comparative experiments by John R. Rippetoe with alcoholic fluidextracts and fluidglycerates prepared from identically the same digitalis and ergot, apparently indicate from their effect on frogs and roosters respectively, that the fluidglycerates of the two drugs are inferior in their physiological actions to the hydro-alcoholic fluidextracts prepared in the same proportions.—Amer. Journ. Pharm., Feb., 1909, 84–86.

GLYCERITA.

Glycerite of Bismuth, N. F.—Modification of Manipulation.—Dr. E. H. Squibb suggests to modify the manipulation directed in the N. F. formula for bismuth glycerite, by using 5000 Cc. of distilled water, instead of 1000 Cc., for diluting the magma produced. This insures complete precipitation of the bismuth salt. No change is required in other respects.—Bulletin A. Ph. A., Sept., 1908, 280.

Glycerite of Heroin, Comp.—Formula.—George P. Mills suggests the following formula for a comp. glycerite of heroin:

Each drachm represents

Heroin	1–24 gr.	075. Gm.
Ammon. hypophosphite	3 grs.	50. Gm.
Flext. henbane	½ Min.	8. Cc.
Flext. white pine	3 Min.	50. Cc.
Soluble tr. tolu, N. F. to flavor	3 Min.	50. Cc.
Glycerin to make	60 Min.	1,000. Cc.

Dissolve the heroin in the flext. white pine by gentle heat and add a portion of the glycerin. Dissolve the ammonium salt in the tincture of tolu, with heat; mix with remainder of glycerin. Mix the two solutions, add the flext. henbane: stir well.—Bulletin A. Ph. A., Nov., 1908, 344.

Glyceritum Hydrastis Compositum.—A formula for inclusion in the N. F. is recommended by F. W. Nitardy in the "Proceedings" of this Association, 1908, 1034.

LINIMENTA.

Liniments of the National Formulary—Satisfactory Composition.—Otto Raubenheimer critically reviews the formulas for the 8 liniments official in National Formulary and makes some minor suggestions for their improvement. He finds, however, that in general the formulas give very good satisfaction and may unhesitatingly be recommended to physicians as elegant preparations in place of the products of special composition exploited by manufacturers.—Amer. Drugg., Dec. 14, 1908, 346.

Linimentum Ammoniae, Snow-white and Permanent is the title of a paper by Otto Raubenheimer, printed in the "Proceedings" of this Association, 1908, 1030–1033.

Camphorated Oil — Determination of Camphor Substitutes.—F. W.

Richardson and W. Walton communicate the details of analysis of camphorated oil for camphor substitutes, their paper dealing with the analysis of natural and artificial camphor, oil of turpentine, and volatile oil of camphor, all of which may be present in adulterated preparations. Camphorated oil lends itself almost entirely to physical methods of analysis. If the specific gravity, refraction index, and polarimetric readings are all normal, there is little doubt as to the genuineness of the sample, and if, in addition, the loss on drying in shallow layers at 100° C., and the iodine number are normal, all doubts as to the purity of the sample are removed. But when substitutes for camphor have been used, further data are necessary. The camphorated oil is distilled, under specific directions, the distillate (white crystalline masses, etc.) is carefully dissolved in carbon tetrachloride, and the weight of the solution is accurately ascertained. Three portions of this solution were used: (1) to determine the specific gravity and (2) the iodine number, while a third portion is subjected to polymerization with sulphuric acid and distillation, for which explicit directions are given. The polymerization is so complete in the case of oil of turpentine and volatile oil of camphor that no optically active substance distils over: 95.0 per cent. of the camphor are left unchanged and volatilize. The change in the specific gravity and refraction index of the carbon tetrachloride solution enables the calculation of the weight of total camphors, while the polarimetric reading in a 200-Mm. tube, multiplied by 0.22385 and divided by 0.95, gives the *natural camphor*. This deducted from the total camphors estimated by the change in the specific gravity of the solvent leaves the *artificial camphor*. If there is no reading, natural camphor is absent. In the calculations the following iodine numbers are assumed: Camphor natural, 5; artificial, 7; volatile oil of camphor, 180; oil of turpentine, 370. The authors append a number of examples.—Pharm. Journ., Jan. 2, 1909, 3–4.

Soap Liniment—Improved Formula.—E. G. Raeuber suggests the following formula for preparing soap liniment, which is permanently clear and does not gelatinize:

Take of—

Oleic acid	8 troy ounces.
Sodium hydroxide	640 grains.
Oil of rosemary	648 minims.
Camphor	5 troy ounces, 376 grains.
Alcohol	100 fluidounces.
Water, sufficient to make	1 gallon and 6 fluidounces.

Dissolve the sodium hydroxide in one pint of water, add the oleic acid, and heat gently on a water-bath until saponification is complete, which takes but a few minutes. Dissolve the camphor and oil of rosemary in the alcohol, add the soap solution and enough water to make 1 gallon and 6 fluidounces, and filter.—Proc. Penna. Pharm. Assoc., 1908, 30.

Spiritus Saponatus, G. P., IV.—Expeditious Method of Preparation.—Ernst Richter, referring to the suggestion of Jung to prepare "Spirit. saponat. kalinus" (which see) with concentrated solution of potash, recommends the following adaptation of the idea to the preparation of *Spiritus saponatus, G. P., IV:* 600 Gm. olive oil and 500 Gm. alcohol are heated on the steam-bath in a tared flask until the alcohol begins to boil. A warm solution of 105 Gm. potassium hydroxide in 210 Gm. distilled water is then added to the hot oil mixture and vigorously shaken until the temperature suddenly rises, whereupon the mixture becomes clear within a minute and the saponification is completed. The alcohol lost by evaporation having been restored, the solution is allowed to cool somewhat, 2500 Gm. alcohol are added and mixed, and then gradually 2085 Gm. distilled water with continuous shaking.—Apoth.-Ztg., xxiv (1909), No. 26, 230.

Spiritus Saponatus Kalinus — Extemporaneous Process.—Ed. Jung recommends the following extemporaneous process for preparing Spiritus Saponatus Kalinus: 100 Gm. linseed oil and 75 Gm. alcohol are mixed in a 500-Cc. flask, which is placed in warm water, and a solution of 20.2 Gm. potassium hydroxide in 33 Gm. distilled water is added to the warmed contents of the flask and vigorously shaken. The saponification is completed in *one minute*, and the preparation is then finished by the addition of 81 Gm. of water and 166 Gm. of alcohol.—Apoth.-Ztg., xxiv (1909), No. 17, 155.

LIQUORES.

Solutions—Chemical Reasons why they Deteriorate.—A paper by Frederic E. Niece in the Proceedings of this Association, 1908, 1050–1054.

Official Iodine Solutions are criticised and improved formulas suggested for them by F. W. Nitardy in the Proceedings of this Association, 1908, 1024–1025.

Liquor Aluminii Acetici—Preservation of its Dilutions with Boric Acid.—E. Gecker questions the advisability of adding boric acid to the official (undiluted) solution of aluminum acetate, which has been frequently recommended for its preservation. He finds that the clear filtrate obtained after such addition soon forms a considerable white crystalline precipitate, which even has an influence upon the specific gravity of the liquor. On the other hand, he regards the addition of a little boric acid to the dilutions as being not only admissible, but decidedly advantageous, since they retain their transparency for weeks when so treated, while under ordinary conditions they may gelatinize within several hours or a few days, according to the prevailing temperature.—Pharm. Ztg., liv (1909), No. 9, 86.

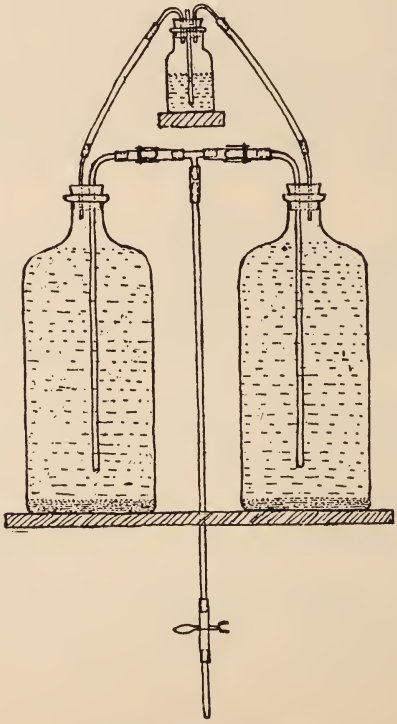
Liquor Aluminii Acetici—Instability Due to Calcium Sulphate.—W. Grüning attributes the instability of solution of aluminum acetate to the

presence of calcium sulphate, which causes the formation and precipitation of a basic acetate. As a remedy, the author recommends the elimination of calcium sulphate by the addition of barium sulphate, and proposes the following procedure: To the solution prepared according to the official (G. P.) direction from 1000 Gm. aluminum sulphate, a concentrated solution of 140 Gm. barium acetate is added until precipitation of barium sulphate ceases. Then, to remove excess of barium sulphate, 10 Gm. aluminum acetate, dissolved in a small quantity of water, is added. The filtrate is claimed to possess unlimited stability.—Pharm. Zentralh., L. (1909), No. 20, 395.

Lime Water.—A method of preparation that ensures conformity with the U. S. P. requirements is described by W. L. Cliffe in the "Proceedings" of this Association, 1908, 1033.

Lime Water—A Twin Container.—F. W. Nitardy suggests a double syphon bottle for the storage and preservation of lime water, which assures

FIG. 52.



Double Syphon Bottles.

a constant supply under conditions most favorable to its reliable strength. The arrangement shown by Fig. 52 is self-explanatory. It consists of two two-gallon bottles, provided with bi-perforated rubber stoppers, each

bearing a long tube with the outer limb bent at right angles, and a short tube, passing just through the stopper. The long tubes, which extend to within a few inches of the bottom of the bottles, are joined by the aid of short sections of pure rubber tube (bearing clamps) with a T-tube, to the vertical central limb of which a long glass tube extends downward some distance below the shelf—a short delivery tube being attached to the lower end with a section of rubber tube, also closed with a clamp. The short glass tubes are connected by sections of rubber tubing with two short bent tubes fitted into the stopper of a wide-mouth bottle, one-half filled with strong solution of caustic soda (about 30 per cent.), into which the outer air is admitted by a longer central tube extending to near the bottom. The twin bottles having been filled with lime water containing an excess of lime, as directed by the U. S. P., the water may be withdrawn from the one or the other of the bottles, by closing one of the clamps and, the other being open, opening the clamp in the delivery tube. The air replacing the water is during its passage through the caustic soda solution completely deprived of its carbonic acid, and the water may therefore be withdrawn completely without loss of calcium hydroxide by conversion into carbonate. The caustic soda solution in the wash bottle must be renewed from time to time (every 3 to 6 months) and the lime in the containers should also be changed occasionally.—West. Drugg., Feb., 1909, 105.

Cresol Soap Solutions—Method of Valuation.—Spalteholz has experimented to determine a method for the valuation of solutions of cresol soap. The demands made on a good cresol soap solution are: (1) Miscibility with water to form clear solutions in all proportions. (2) The cresol must be present in a free state, not combined with alkali. (3) There must not be an excess of soap present in the solution. In search of a method for the expeditious estimation of the water content of such solutions, the author takes in consideration the observation that cresol soaps form clear solutions with concentrated acetic acid, which become turbid on the addition of water, owing to the splitting-up of the soap and consequent liberation of the fatty acids and the cresols. With concentrated acetic acid all cresol soap solutions, independent of their water content, yield clear solutions; but with diluted (50 per cent.) acetic acid, eventual turbidity results in all cases, depending on the water content of the original cresol soap solution. This makes it possible to determine the degree in which the water content of a sample differs from the established standard.—Pharm. Ztg., liv (1909), No. 18, 178; from Chem. Ztg., 1909, No. 21.

Liquor Cresoli Saponatus—Modification of G. P. Process.—A. Roos recommends the following modification of the G. P. process of preparing cresol soap solution, which, similar to the process of preparing "Spiritus saponatus, G. P., IV," obviates the application of heat, is simple and

cleanly and yields a satisfactory product: Into a stoppered 1-liter flask place 60 Gm. potassium hydroxide, 30 Gm. distilled water and 30 Gm. alcohol and, when solution is completed, add 300 Gm. linseed oil; shake the mixture vigorously several minutes and set the flask aside for several hours in a moderately warm place. Then add 120 Gm. more of distilled water and allow the mixture to stand in a moderately warm place, occasionally shaking, until the next day, so as to insure perfect saponification. On now adding 500 Gm. of cresol this readily dissolves by simple agitation in a short time and without the application of heat. The resulting preparation is light yellowish-brown, forms a perfectly clear solution with distilled water, and has a specific gravity of 1.0298–1.030. The uniformity of solutions of cresol soap is affected only by the quality of the cresol employed, which may contain water in variable proportions—usually about 8 per cent. Absolute uniformity is therefore not to be expected.—Pharm. Ztg., liv (1909), No. 12, 118.

Liquor Ferri Albuminati—Preparation by Simple Admixture and with the Entire Egg-substance.—Discussing commendably certain improvements in the formula and process of preparing solution of iron albuminate proposed for the forthcoming revision of the G. Ph., Beysen suggests the practicability of preparing a satisfactory solution by simple admixture of the ingredients, including the use of the entire content of fresh eggs—yolk and white—instead of the dried albumen now directed. He finds that if 126.0 liq. ferr. oxyd. dialys., 200.0 white syrup and 3.5 solution of sodium hydroxide are mixed together, and a solution of 80.0 of well-beaten fresh egg substance in 200.0 of water, is added in small portions at a time, no precipitation results, and the mixture remains clear. That the resulting solution is not mearly a mixture, but actually a chemical combination, is evident from the fact that it will form a clear mixture with alcohol, and that if the albumen solution is added to the mixture of iron solution and syrup *without* addition of alkali, a precipitate is formed, which dissolves completely on subsequent addition of the prescribed quantity of alkali.

Made with the entire egg substance, the solution has a clayey appearance, though transparent. When made with egg-white alone, it is dark brown and perfectly bright. In either case, the mixture is allowed to stand several hours before adding the other ingredients (aromatics and water) and adjusting the product to the prescribed quantity. The author considers the presence of the valuable constituents of the egg quite desirable, but that in any case the impurities introduced by this simplified process do not interfere with the efficacy of the preparation.—Pharm. Ztg., lii (1908), No. 103–104.

Liquor Ferri Albuminati, N. F.—Improved Formula.—Dr. E. H. Squibb recommends the following formula for preparing solution of iron

albuminate, which differs in certain important respects from the N. F. formula:

Egg albumen dried	120 Gm.
"Modified" solution of iron oxychloride (which see)	130 Cc.
Sodium citrate	12.5 Gm.
Aromatic elixir	400 Cc.
Alcohol	120 Cc.
Distilled water, sufficient to make	1000 Cc.

Dissolve the egg albumen in 180 Cc. cold distilled water, add the solution of iron oxychloride *modified*, stirring constantly. Allow to stand two hours, then add the sodium citrate previously dissolved in 100 Cc. of distilled water. When the albuminate has dissolved, add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 1000 Cc. Let stand over night and filter.—Bulletin A. Ph. A., Sept., 1908, 281.

Liquor Ferri Albuminati, G. P., IV—Improved Formula.—Dr. Börner observes that the presence of sodium hydroxide in the finished solution of iron albuminate has mitigated against the popularity of the official (G. P., IV) preparation. He finds, however, that the free alkali is not necessary to effect the solution of the iron albuminate, but that it may be replaced with equal efficiency by sodium phosphate. Using the official quantities of dry egg albumen (35 p.) and solution of ferric oxychloride (120 p.), and preparing the well-washed precipitate of iron albuminate by the official directions, this is added to a solution of 5 p. of sodium phosphate in 500 p. of distilled water. When complete solution is effected, 150 p. of water, 100 p. of cinnamon water and 5 p. of aromatic tincture are added in the order named, followed by sufficient water to make 1000 p. of solution. If a turbid (opalescent? Rep.) solution is desired, this may be produced by the careful addition, in small portions at a time, of 1 Gm. citric acid or 1.5 Gm. sodium chloride, awaiting the resolution of the precipitate produced after each addition before adding the next portion.—Apoth.-Ztg., xxiii (1908), No. 87, 795.

"Sweetened" Solution of Iron Albuminate—Formula.—Dr. B. Börner recommends the following formula for preparing a "sweetened" solution of iron albuminate: Prepare iron albuminate from 35 p. of dry egg-albumen and 120 p. of dialysed iron solution according to the G. P. IV, and dissolve washed precipitate in a solution of 3 p. of phosphoric acid and 500 p. of distilled water. When complete solution is effected, add a mixture composed of: White syrup, 160 p.; alcohol, 140 p.; tinct. of vanilla, 1.5 p.; tinct. of orange peel, 6 p.; aromatic tincture, 1.5 p.; tinct. of ginger, 0.5 p. Then follow with enough water to make 1000 p. of solution. The aromatic mixture here recommended is, however, not suitable for making non-sweetened iron albuminate solution, for which

purpose the author suggests a mixture of aromatics similar to that in Dress' solution of iron albuminate, for which a number of formulas are available in the text books.—Apoth. Ztg., xxiii (1908), No. 93, 842.

Liquor Ferri Oxychloridi, Modified — Formula.—Dr. E. H. Squibb recommends the following formula for liquor ferri oxychloridi modified to replace the formula for solution of iron oxychloride given in the N. F.:

Solut. iron tersulphate	350 Gm.
Sodium hydroxide	146 Gm.
Granulated sugar	28 Gm.
Hydrochloric acid	35 Gm.
Distilled water, sufficient to make	1000 Gm.

Mix the solution of iron tersulphate with 4000 Cc. of distilled water. Dissolve the sodium hydroxide and 14 Gm. of the sugar in 4000 Cc. of distilled water. Run the iron solution gradually into the sodium hydroxide solution, stirring constantly. Allow the mixture to stand until the precipitate has settled. Then decant the supernatant liquid. While stirring add to the precipitate 4000 Cc. of distilled water in which has been dissolved 7 Gm. of the sugar. Allow precipitate to settle. Decant as before and wash the precipitate again with 4000 Cc. of distilled water in which is dissolved the remainder of the sugar. Allow the precipitate to settle, draw the supernatant liquid off, drain the precipitate on muslin. Express as much moisture as possible and slowly feed the magma into 35 Gm. of the hydrochloric acid diluted with 50 Cc. of water. When the magma has all dissolved, add distilled water sufficient to make 1000 Gm. Keep in well-stoppered bottles.—Bulletin A. Ph. A., Sept., 1908, 281.

Liquor Ferri Peptonati—Improvement of the N. F. Formula.—Dr. E. H. Squibb recommends the following formula for preparing solution of iron peptonate, which in his experience has proven more satisfactory than the N. F. formula:

Peptone, dry	3.5 Gm.
"Modified" solution of iron oxychloride (which see)	200 Cc.
Sodium citrate	20 Gm.
Aromatic elixir	400 Cc.
Alcohol	120 Cc.
Distilled water, sufficient to make	1000 Cc.

Dissolve the peptone in 150 Cc. of cold distilled water, add the solution of iron oxychloride *modified*, stirring constantly. Allow to stand two hours, then add the sodium citrate previously dissolved in 100 Cc. of distilled water. When the peptonate has dissolved, add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 1000 Cc. Let stand over night and filter.

Liquor Ferri Peptonati cum Mangano, similarly, is prepared by Dr. Squibb as follows:

Peptone, dry	3.5 Gm.
"Modified" solution of iron oxychloride (which see)	71.5 Gm.
Sodium citrate	8 Gm.
Manganese citrate, soluble	8 Gm.
Alcohol	150 Cc.
Aromatic elixir	50 Cc.
Distilled water, q. s. to make	1000 Cc.

Dissolve the peptone in 150 Cc. of cold distilled water, add the solution of iron oxychloride *modified*, stirring constantly. Allow to stand two hours, then add the sodium citrate previously dissolved in 100 Cc. of distilled water. When the peptonate has dissolved add the manganese citrate dissolved in 100 Cc. of distilled water, then add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 100 Cc. Let stand two days and filter.—Bulletin A. Ph. A., Sept., 1908, 281–282.

Liquor Ferri et Mangani Peptonatis, N. F.—Improved Formula.—I. V. Stanley Stanislaus recommends the following formula for making solution of iron and maganese peptonate:

"*Solution A.*"—Dissolve 30 Gm. of dry peptone in 1000 Cc. of hot distilled water.

"*Solution B.*"—Dissolve 2.1 Gm. of manganese carbonate in 58.6 Gm. of solution of ferric chloride, U. S. P.

Pour solution B into solution A, stirring constantly, and the mixture should be carefully neutralized, if necessary, with one per cent. solution of sodium hydroxide. A precipitate of iron and manganese peptonate will be formed which should be washed by decantation until free from chlorides. It is then collected upon a filter, drained, rubbed up in a porcelain capsule with

Syrup	200	Gm.

warmed with

Sodium hydroxide (10 per cent. solution	20	Gm.
Citric acid	5	Gm.

until all is dissolved, and this is then diluted with

Distilled water to	750	Gm.

When cool, add

California brandy	240.0	Gm.
Tincture of vanilla	2.5	Gm.
Tincture of orange	5.0	Gm.
Tincture of cinnamon	2.5	Gm.
Acetic ether	5	drops.

Or, instead of the tinctures use

Tincture of cardamom comp. U. S. P.	10 Cc.

—Proc. Penna. Pharm. Assoc., 1908, 161.

Liquor Potassii Arsenitis is the subject of a critical note by A. B. Lyons, which is printed in the Proceedings of this Association, 1908, 901–905.

Liquor Seriparus, B. P. C.—Preparation with Fresh Rennets.—Harold Wyatt recommends the preparation of liquid rennet with fresh rennets, which secure an equally active product and superior, as regards freedom from smell, to one made from dry, salted rennets: 30.0 rennet, fresh, is rubbed well with 10.0 salt, cut up into small pieces and macerated with 50.0 chloroform water and 10.0 glycerin for four days; then add 10.0 alcohol and 10.0 sherry, allow to stand three days, and strain. Next shake with 2.50 kaolin, and set aside for a week. Finally, decant the clear solution, filter the remainder, add 0.315 lactic acid and enough chloroform water to make 100.0.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 445.

Solution of Chlorinated Soda is the subject of a paper by H. V. Arny and O. H. Dawson published in the Proceedings of this Association, 1908, 841–845.

Compound Solution of Sodium Phosphate, U. S. P., is criticised by H. G. Posey in a paper printed in the Proceedings of this Association, 1908, 980.

Compound Solution of Sodium Phosphate—Improved Formula.—G. M. Towle says that the official formula for compound solution of sodium phosphate is very poor and should be abandoned. A good, permanent solution can be made as follows:

Sodium phosphate	1000 Gm.
Potassium nitrate	14 Gm.
Citric acid	155 Gm.
Distilled water to make	1000 Cc.

Heat 250 Cc. of water to about 50° C.; in this dissolve potassium nitrate and citric acid, then add sodium phosphate gradually, while maintaining temperature as above. Filter and store in a fairly warm place.

This solution will precipitate at about 10 degrees C., but the crystals can be readily redissolved by warming slightly.—Proc. Ohio State Pharm. Assoc., 1908, 56.

Liq. Sodii Phosph. Comp.—Improvement of Formula.—John K. Thum, after experiments with varying proportions of the ingredients in the U. S. P. formula for compound solution of sodium phosphate, finds that the simple reduction of the quantity of sodium nitrate to 1 per cent. will entirely prevent the formation of crystals in this solution on standing. The officially prescribed quantity of sodium nitrate (4 per cent.) facilitates the

recrystallization, while the reduced quantity (1 per cent.) inhibits it. In lieu of the pharmacopœial directions for making this solution, the author recommends the following method of procedure as being more satisfactory. Place the two salts and the acid, with a small quantity of water, into a graduated flask and heat on a water-bath until completely liquefied; then add sufficient distilled water to make the required volume.—Amer. Jour. Pharm., Jan., 1909, 10–11.

MISTURÆ.

Mistura Rhei et Sodae, U. S. P.—Original Formula.—Thos. D. McElhenie mentions that the formula for the mist. rhei et sodæ of the U. S. P. originated some thirty years ago with the late Dr. Thos. M. Rochester, who, however, never prescribed it under its present pharmacopœial title, but always transcribed the formula in detail as follows:

℞—Sodii bicarb. ..... ℥ij.
Tinct rhei ..... f℥ij.
Aq. cinnamomi ..... f℥j.
Aq. menthæ pip. .....ad f℥iij.
M.

The doctor's contention was always that the use of glycerin promoted acidity of the stomach, a condition which the mixture is intended to relieve.

The above formula has an excess of sodium bicarbonate and is always dispensed as a "shake" mixture. If glycerin is objectionable in an antacid mixture, Mr. McElhenie suggests that this formula replace that now in the Pharmacopœia under the same title, leaving the N. F. formula to stand for those prescribers who want glycerin used. Worked out to the usual U. S. P. quantity of 1000 Cc. the formula would be as follows:

	1 Gallon.	1000 Cc.
Oil of caraway	20 minims.	0.308 Cc.
Oil of peppermint	20 minims.	0.308 Cc.
Sodium bicarbonate	10⅔ ounces.	87.5 grams.
Hot water	7 pints.	850.0 Cc.

Make a solution and add

Tincture of rhubarb	10⅔ fl. ounces.	87.5 Cc.
Water enough to make	1 gallon.	1000 Cc.

—Pharm. Era, June 24, 1909, 587.

Mixtura Sennæ Composita, B. P.—Improved Formula.—Harold Wyatt recommends the following modification of the B. P. formula for compounding mixture of senna, which is particularly suitable where quantities are wanted for stock: Mix 25.0 magnesium sulphate with 10.0 senna and pour on 50.0 of boiling water. When the infusion has cooled to blood-

heat, stir in 0.62 strong solution of ammonia. Strain when cold, and wash the dregs with enough boiling water to make 80.0 of strained infusion when cold. To this add a mixture of 13.0 compound tincture of cardamoms, 2.0 strong tincture of ginger (1 : 2) and 0.21 chloroform, then 5.0 fluidextract of licorice, and finally enough water, if necessary, to make 100.0 of mixture.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 445.

OLEA.

Phosphorated Oil--Limonen a Preservative.—Hugo Korte communicates the results of numerous experiments made with the object of determining the conditions best adapted for the preparation and preservation of phosphorated oil. Of the different fixed oils used as solvent for the phosphorus he finds expressed oil of almonds to give the most satisfactory results, the phosphorated oil keeping well if carefully preserved in the dark and in full containers. The stability of the oil is, however, markedly augmented by the addition of 1 per cent. of limonen, the characteristic hydrocarbon ($C_{10}H_{16}$) of lemon oil, as originally recommended by Schweissinger. Preserved in this way phosphorated oil will keep well even when exposed to light. Oil of lemon, although otherwise soluble as a preservative is not advised because the commercial oil almost invariably contains some water The author gives explicit directions for preparing the phosphorated oil, and recommends that it be stored in a dark place in vials of dark glass of 30 Cc. capacity.—Pharm. Ztg., (1908), No. 67, 655.

Mercuric Iodide Oil — Modification of the Formula of the French "Codex."—The new French Pharmacopœia has adopted a formula for mercuric iodide oil, which directs the solution of 0.2 Gm. of mercuric iodide in 46 Gm. (= 50 Cc.) of sterilized olive oil. Lemaire recommends poppyoil as a better solvent for the mercuric iodide, which permits the preparation of an oil containing 5 instead of 4 Mgm. of the iodide in each cubic centimeter. But even this concentration is not as great as is frequently desired by physicians and he therefore suggests the intervention of ricinus oil, which permits the preparation of a solution containing 10 Mgm. of the iodide in each cubic centimeter, the proposed formula being as follows: Mercuric iodide, 1.0 Gm.; sterilized ricinus oil, 50 Cc.; guaiacol, 3.0 Gm.; poppyoil, purified with alcohol and sterilized, add 100 Cc. The preparation must be protected from light.—Pharm. Ztg., liv (1909), No. 280; from Rép. de Pharm., 1909, No. 3.

Stearate of Mercury—Method of Preparation.—D. B. Dott, discussing the B. P. Method of preparing oleate of mercury, also takes into consideration a method for preparing stearate of mercury from commercial stearic acid. In this, the correct method would probably be to find the equivalents of the stearic acid and soda, then to combine them with the aid of alcohol in their proper proportions, and add to solution of equivalent

quantity of mercuric chloride dissolved in water. The following rough method answers very well:

Dissolve 20 parts commercial stearic acid in boiling solution of 3½ parts of caustic soda in 140 parts of water. Then add hydrochloric acid till there is a slight permanent oily separation. Next add carbonate of soda solution in just sufficient quantity to redissolve the oily acid, stirring well after each addition. Dissolve 18½ parts of mercuric chloride in about 70 parts of hot water. Mix the two solutions thoroughly, collect the precipitate, wash till practically free from chloride, dry under 100° C., and powder. The product is a white powder, much more permanent and satisfactory in its properties than the oleate. By reduction with hypophosphorous acid in presence of alcohol, 1.392 Gm. gave 0.338 Gm. mercury = 24.28 per cent., or 26.22 per cent. mercuric oxide. As regards mercury content, the author says that a stearate prepared as described is practically equivalent to the oleate.—Chem. & Drugg., May 22, 1909, 785.

PASTÆ.

Detergent Paste—Cheap and Efficient Formula.—Dr. H. C. Caseldine recommends the following formula for a very cheap and most excellent cleansing paste for clothes, carpets, rugs, etc.:

Sulphuric ether	½ ounce.
Alcohol	3 ounces.
Aqua ammonia (28 per cent.)	1½ ounces.

Mix and add to the following: 1 gallon of water in which has been dissolved cakes of ivory soap.

This mixture congeals, forming a paste which is excellent for the purposes mentioned.—Bull. Pharm., Feb., 1909, 73.

Phosphorus Paste—Manufacture.—E. G. Raeuber gives the following detailed description of the manufacture of phosphorus paste: The phosphorus is placed with glucose in an apparatus on the order of an ice-cream freezer. This vessel with its contents is heated in a water-bath and the temperature maintained at 50° C. until the phosphorus is melted. The churner is then inserted into the can and the mixture churned for one-half hour, or until it has the appearance of an emulsion. A paste composed of glucose, flour and water is then added and the mixture churned until a uniform paste results. It is then ready to put up into small cans. In this way the author makes 1200 pounds at a time.—Proc. Wisc. Pharm. Assoc., 1908, 31.

PILULÆ.

Pills.—Simple method of determining their *quinine* content, which see under "Organic Chemistry."

Enteric Pills—New and Satisfactory Coating.—L. Danzel recommends

the following mixture, which he claims to be more satisfactory than the coatings usually employed for rendering pills insoluble in the stomach, but capable of easy disintegration in the intestines: Benzonaphthol, 6; tannigen, 10; salol, 20; alcohol (90 per cent.), 30; ether, 100. Dissolve. The pills are coated with this in a spherical box, and dried. The coating obtained is very hard, is unattacked by dilute acids, but readily dissolved in dilute alkali. It is more practicable to apply than keratin or melted salol and gives a more uniform coat than salol in ethereal solution. —Pharm. Journ., April 3, 1909, 463; from L'Union Pharm., *50* (1909), 59.

Salol-coated Pills—Improved Composition of Coating.—On account of the salol being very brittle, the coating of salol coated pills is easily broken off as ordinarily applied. P. W. Byrd finds, however, that the addition of a little balsam of tolu will overcome this brittleness and leave the coating in a condition in which it is readily soluble in a 0.3 per cent. solution of sodium carbonate at a temperature of 107° to 108° F., and consequently under conditions similar to those which exist in the duodenum. The salol, which is kept liquid on a water bath as near as possible to its melting-point (107° to 108° F.), five per cent. of balsam of tolu is added. A perfect solution results, into which the pills are dipped by the aid of a needle, and rotated, after removal, between the thumb and finger until the coating has cooled. A second dipping will generally suffice to give a sufficiently thick coating, which is afterwards smoothed by rotating the pill, still fixed on the needle, for a few seconds over a heated surface, such as a wire gauze over a Bunsen flame. The needle hole is finally sealed with a droplet of the melted salol-tolu mixture applied with the point of the needle.—Pacif. Pharm., July, 1908, 117.

Blaud's Pills—Formula of the French Pharmacopœia, 1908.—Lemaire interestingly reviews the evolution of the formula for Blaud's pills in the French Pharmacopœia. In the third edition of his "Pharmacopée raïsonnée (1847), Guibourt gives the following formula: Ferr. sulfur. crist., 16.0; kal. carbon., 16.0; tragacanth, 2.0; aqua dest., q. s. ad. pil., 96. This formula, he states, is the original formula of Dr. Blaud, which, however, directed the division of the mass into 48 pills instead of 96 pills; the latter division having been adopted because of the enormous size (0.8 Gm.) of the pills obtained by the original directions. The formulas of the French Pharmacopœia of 1866 and 1884 are identical as far as the mass is concerned, but differ in the division of the mass into pills, the 1866 edition directing 120 pills to be made from a mass composed of 30.0 Gm. each of *dried* ferrous sulphate and dried potassium carbonate, 5.0 Gm. of acacia; 15.0 Gm. of simple syrup, and 30 Gm. of distilled water, whereas the 1884 edition of the Codex directs 200 pills to be made from the same mass. The disparity in the directions is believed to be due to a misconception of which is to be understood by "ferr. sulf. sicc. pulv.," and is

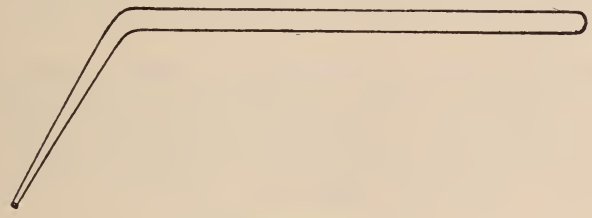
now avoided by the adoption of the following formula in the Codex of 1908:

Ferr. sulfuric pur.	15.0
Kal. carbona	7.5
Gummi arab. pulv.	2.5
Rad. liquirit. pulv.	5.0
Aqu. dist.	15.0
Sir. simple	7.5

These are to be massed and divided into 100 pills, each weighing 0.3 Gm., and containing about 0.03 Gm. of iron.—Pharm. Ztg,. liv (1909), No. 11, 104; from Rép. de Pharm., 1909, No. 1.

Mercurial Pill Mass—Method of Estimating Mercury in Commercial Samples.—Gilbert Simpson proposes the following method, which he has used with convenience and satisfaction, for assaying commercial mercuric pill mass: A piece of combustion tube about thirty (30) centimeters in length is sealed at one end and, after filling, is drawn out at the other and bent, as shown in the diagram (Fig. 53). The charge consists of a column of sodium bicarbonate 5 centimeters long, asbestos fiber, soda lime 5 cen-

FIG. 53.



Combustion Tube.

timeters, 10 Gm. of the pill mass rolled into a pipe of about 8 centimeters, soda lime 5 centimeters, and finally a plug of asbestos fiber. The distillation is conducted slowly and the first furnace flame applied at about 5 centimeters from the bend in the tube. This allows the bulk of the mercury to collect in one globule near the bend and the tarry matter to pass over into the receiver—a beaker of water—which is covered with a large watch-glass to prevent loss of mercury (mechanically carried over) by spurting. The heating is further conducted by the usual method from the bend to the second portion of soda lime, and the globule of mercury then carried over into the receiver by applying the flame of an ordinary Bunsen burner, the last trace of mercury being drawn over by heating the sodium bicarbonate at the end. The end of the tube in the receiver is now broken off, and any minute globule and resin removed from this with ether. Ether is now floated on the liquid in the receiver; this dissolves the resin and liberates the included mercury. The mercury is then washed with 90

per cent. alcohol by successive decantations, then transferred to a crucible, washed with ether, dried by slight heat, and finally weighed. Concordant results were obtained by the author on subjecting a sample of the official Pil. Hydrarg., B. P., twice to the process described. The results obtained with ten commercial samples are exhibited in a table.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 469–471.

PULVERES.

Granular Effervescent Powders, N. F.—Defects.—At the December (1908) meeting of the Baltimore Branch of this Association, Mr. J. J. Barnett pointed out what he considered the three defects of the N. F. granular powders, as follows:

1. The use of sugar, which seemed out of place in those preparations for the production of artificial mineral waters, and which invariably caused discoloration in time, whereas the powder should remain white.

2. That the formulas were incorrect, in that they made no allowance for the CO_2 lost in the reaction, and which loss caused an increase in the percentage of the medicinal agents. This increase was of no seriousness in these preparations, but should be corrected.

3. That the constant stirring of the mass is directed during the heating process. Better results could be obtained by heating, passing through a sieve and drying.

To obviate these defects he proposed the omission of sugar, saccharin being used if desirable to sweeten; the change of base to allow for loss of CO_2; the inclusion of the following general directions: "Heat mass at from 93° to 104° C., pass through a sieve of proper size and dry at 54° C."—Bulletin A. Ph. A., Jan., 1909, 24.

RESINÆ.

Jalap Resin—Examination and Valuation.—W. B. Cowie, after pointing out the deficiencies of the B. P. official tests for the examination and valuation of jalap resin, and the advance made in the tests of the U. S. P., observes that even the latter could be greatly improved by being carried to a more definite conclusion, and he presents the following scheme which he has evolved from considerable practice in the examination of this resin:

(*a*) Dry about 5 Gm. of the resin to constant weight at 110° C.

(*b*) Determine the ash in about 1 Gm. of the anhydrous resin.

(*c*) Weigh about 1 Gm. anhydrous resin, place in a glass mortar, powder, add 10 Cc. of 0.720 ether, and stir assiduously for two and a half minutes, pour the ethereal solution through a small funnel containing a plug of cotton into a tared flask, repeat thrice, using 10 Cc. ether each time, ten minutes being allowed for the four digestions, and the mass being thoroughly broken up with the pestle each time. Finally wash the cotton with 5 Cc.

ether, recover the ether, dry to constant weight at 110° C. and weigh. = *Solubility in ether.*

(*d*) Weigh out 1 Gm. anhydrous resin, dissolve in 30 Cc. accurately neutralized 90 per cent. alcohol at 15° C., titrate with $\frac{N}{2}$ alcoholic KOH, using phenolphthalein as indicator, note the number of Cc. required to complete neutralization, and calculate into the *acid value.* Then run in 25 Cc. $\frac{N}{2}$ alcoholic KOH, boil under a reflux condenser for one hour, cool and titrate back with $\frac{N}{2}$ HCl, using phenolphthalein as indicator. The difference in Cc. between the blank and the actual experiment gives the number of Cc. fixed by the resin during saponification, and the saponification equivalent is obtained by using the formula :

$$\text{Saponification equivalent} = \frac{\text{Milligrams of resin employed.}}{\frac{\text{Cc. HCl in blank—Cc. HCl in actual experiment}}{2}}$$

Therefore,

$$\frac{\text{Milligrams of resin employed}}{\text{Cc. Normal KOH required}} = \text{Saponification equivalent.}$$

(*e*) Dissolve 0.25 Gm. resin in 5 Cc. acetic anhydride, add 2 drops conc. H_2So_4, when no purple color should be produced. = *Absence of colophony.*

(*f*) A little of the resin moistened with alcohol should give no greenish-blue color on adding a few drops of ferric chloride solution. = *Absence of guaiacum.*

(*g*) Water triturated with a little of the resin should neither become colored nor dissolve any of it (= *absence of soluble impurities*), and it should be free from bitterness (= *absence of aloes*) ; after boiling and cooling, a portion of this mixed liquid should give no blue color on adding a few drops of iodine solution (= *absence of starch*).

In the examination of a few jalap resins according to this scheme the following results were obtained :

Description.	Moisture, per cent.	Ash, per cent.	Solubility in 0.720 ether, per cent.	Acid Values.	Saponification Equivalent.
Resina jalapæ alba.....	3.0	0.02	0.3	2.8	417
Resina jalapæ alba	3.1	0.22	0.3	2.8	417
Jalapin [= Ether-soluble portion of pure Jalap resin].....	—	—	—	2.8	408
Resina jalapæ fusca.....	5.0	0.3	10.0	14.0	333
Resina jalapæ fusca	5.6	0.3	10.0	11.2	338

Among the deductions drawn by the author from this and other observations, which must be consulted in the original, the following may be mentioned: A good jalap resin which has been well stored should not contain more than 6 per cent. of moisture. An ash limit of 1 per cent. can reasonably be adopted. The acid value limit should be 8.4 for white resins and 20 for brown resins. The normal constant of 408 for the saponification equivalent, as shown in the table, is obtained with jalapin; the higher figures in the case of the white jalap resins are due to natural impurities, while the lower figures obtained with brown resins are due to the presence of scammonin in these samples as the chief impurity, which possesses a much lower saponification equivalent than jalapin. Furthermore, in order to judge the relative values of commercial jalap resins, they require to be placed in two distinct classes:

(*a*) *White jalap resins* (almost free from scammonin), and (*b*) *brown jalap resins* containing varying amounts of scammonin.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 448–454.

Resin of Podophyllum—Partial Insolubility in 90 per cent. Alcohol by Age.—Having some years ago noted that none of the commercial samples of resin of podophyllum examined were completely soluble in 90 per cent. alcohol, some samples giving as much as 10 per cent. of residue, Samuel Taylor made an experimental investigation of the probable causes and finds that insolubility is apparently due to the age of the resin. A sample completely soluble when freshly prepared, in 12 months gave an insolubility of 0.4 per cent., and in a further 12 months of 0.7 per cent. A sample taken from stock gave 0.4 per cent. insolubity increasing in 12 months to 1 per cent., and in another 12 months to 2.6 per cent. In another case a fresh and completely soluble sample after two years gave an insolubility of 2.4 per cent. It would be proper, therefore, to state in the B. P., instead of soluble in 90 per cent. alcohol, that the insolubility should not exceed 2 per cent.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 530–531.

Scammony Resin—Detection of Resin from Roots.—Experiments made by Guiges lead him to the conclusion that the ether method for the detection of scammony resin from roots is not reliable. He finds, however, that the difference in the optical rotation of the two kinds of resins permits the easy recognition of adulterations, since the resin of the roots shows a rotation of $a_D = -18°30'$ to $-23°30'$, while the resin from scammony shows a maximum of $a_D = -24°30'$.—Pharm. Ztg., liii, (1908). No. 89, 879; from Bull. Soc. Chim. France, 1908.

Scammony Resin—Examination and Valuation.—W. B. Cowie observes that his criticism on the B. P. and U. S. P. tests for the examination and valuation of jalap resins (which see) applies with equal force to the tests given in these works on scammony resin in everything but the ether-solubility limit, and that the scheme suggested will stand throughout in

the detailed particulars without the slightest modification excepting in paragraph (*C*), where the 1 Gm. of the white resin should be entirely soluble in 15 Cc. of 0.720 ether, and the brown resins should be soluble to the extent of 95 per cent., using anhydrous resin, and drying to constant weight at 110° C. The following results were obtained in the examination of a few samples of scammony resins according to this scheme (which see):

Description.	Moisture at 110° C., per cent.	Ash, per cent.	Solubility in 0.720 ether, per cent.	Acid Value.	Saponification Equivalents.
Resina scammon. alba	2.52	0.02	complete	2.8	241
Resina scammon. alba	5.3	0.02	complete	2.8	241
Pure scammonin	—	—	complete	2.8	240
Pure scammonin fusca	4.5	0.15	96.4	28.0	263
Pure scammonin fusca	5.1	0.15	96.4	25.25	263

While the respective tests for colophony, guaiacum, starch and aloes were in the negative, these should be retained in the scheme for the examination of scammony. The author suggests an acid value of 8.4 for white scammony resin and 34 for brown resins. The saponification equivalent, which based on pure scammonin is approximately 240, increases with the increase of impurities in the brown resin. The relative value may be arrived at by employing the following formula:

$$\text{Percentage purity in terms of scammonin} = \frac{240 \times 100}{\text{Sap. equivalent of resin found.}}$$

For example, the saponifying equivalent of a white scammony resin is found to be 244, then

$$\frac{240 \times 100}{244} = 98.36 \text{ per cent., the percentage purity of the samples.}$$

—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 457–460.

Scammony Resin—Constants and Distinction from the "False" or "Mexican" Scammony.—Frank O. Taylor has made a comprehensive examination of a number of specimens of scammony resin which had been carefully made from the crude drug, and comprised specimens obtained both from true scammony (*Convolvulus Scammonia*) and from the "false" or "Mexican" scammony (*Ipomœa Orizabensis*), which are identified in the table of results as follows: Number 9, known to be a sample of Mexican scammony; numbers 2 and 3, expected to contain greater or less amounts of Mexican scammony intermingled with true scammony; num-

bers 1 and 8, of uncertain origin, though presumably from true scammony; numbers 4, 5, 6 and 7, known to be obtained from *Convolvulus scammonia*. Data were also available that it was possible to determine the yield of resin from the drug used. The results of the examination, which is described in some detail, are exhibited in the following table:

No.	Yield.	Moisture, per cent.	Ash, per cent.	Ether Soluble, per cent.	Acid Value.	Saponification Value.	Ester Value.	Iodine Value.
1.....	8.1	2.18	0.12	99.0	21.1	232.4	211.3	13.3
2.....	12.2	1.94	0.08	99.5	14.6	198.4	183 8	8.7
3.....	16.75	1.77	0.09	99.6	15.5	186.6	171.1	8.7
4.....	7.93	1.71	0.05	99.7	15.6	238.1	222.5	10.8
5.....	8.06	1.74	0.09	99.3	18.2	238.0	219.8	13.0
6.....	7.71	1.86	0.09	99.3	18.8	240.5	221.7	14.3
7.....	8.52	1.65	0.20	99.0	21.3	239.4	218.1	14.6
8.....	—	2.09	0.15	98.8	14.5	232.8	218.3	10 5
9.....	16.83	2.03	0.22	96.5	21.5	187.1	165.6	11.5

The results show that a resin of very low ash and very high ether solubility may be obtained, where chemical constants can be determined with a considerable degree of accuracy, and that by the saponification value alone we may distinguish between the resin from *Convolvulus scammonia* and that of *Ipomœa orizabensis*.—Amer. Journ. Pharm., March, 1909, 105–111.

Mexican Scammony Resin—Examination.—W. B. Cowie and B. M. Brender have examined Mexican scammony resin, purified by them, together with commercial specimens, according to the scheme of examination and valuation suggested by one of them (Mr. Cowie, see jalap resin), with the following results:

Number.	Moisture per cent.	Ash per cent.	Solubility in 0.720 ether, per cent.	Acid value.	Saponification equivalents.
1	3.05	0.20	72	8.4	295.0
2	3.0	0.18	70	8.4	296.0
3	2.0	0.16	68.6	8.4	327.0

These Mexican scammony resins are remarkable for the high proportion of resin insoluble in ether of 0.720, since they do not agree with the usual statements that Mexican scammony resin is entirely soluble in ether. Moreover, the saponification equivalent of the ether-soluble portion of the resin was found to be 333, and that of the ether-insoluble portion 357. These figures indicate that there must be some other substance present in this resin, as the saponification equivalents of these portions are too far removed from those of jalapin and scammonin. Moreover, the saponification equivalent, melting point, and rotatory power can be changed by continuing the purification of the resin, and the authors are of the opinion that the resin consists of jalapin, scammony and another resin of a lower melting point.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 462–464.

SAPONES.

Soap—Simple Test for Rosin.—J. Sans states that neutral methyl sulphate, or ethyl sulphate, when warmed with a trace of rosin or alkali resinates, give at first a pink color, which passes to violet, and finally to brown on continued warming. The fatty acids and their soaps do not give this reaction. It is, therefore, applicable for the detection of rosin in soap.—Pharm. Journ., May 22, 1909, 697; from Ann. Chim. Analyt. *24* (1909), 140.

Neutral Soft Soap — Preparation for Dermatological Use.—Vicaro recommends the following process of preparing a neutral soft soap for dermatological use: Pure caustic potash, 7 Gm., is dissolved in alcohol (95 per cent.), 100 Cc.; to this solution coco-nut oil, 43 Gm., is gradually added. As soon as complete solution is effected saponification is complete. The alcohol is then distilled off and the residual soap is mixed with an equal volume of water. The warm liquid mass of about 100 Gm. thus obtained sets, when cold, to a white, translucent, perfectly neutral mass, melting at 25° C. It does not blacken calomel nor redden phenolphthalein. The soap may be prepared in a similar manner with lard, 50 Gm., and caustic potash, 11 Gm.; or, with oil of sweet almonds or nut oil, 50 Gm., and caustic potash, 9 Gm. By using alcohol as the vehicle about one-third less of caustic potash is necessary for saponification than when water is employed. Coco-nut oil is to be preferred on account of the great lathering property of its soap. Super-fatted soap may be obtained by adding 4 per cent. of olive oil or 5 per cent. of lard to the above soap basis; or soap ointments may be made by the addition of larger quantities of these or other fats or petroleum oils. These ointment bases may be combined with any medicating ingredient which will not be decomposed. If an alkaline soap is necessary the precise keratolytic action desired may be ensured by the addition of definite quantities of alkalies. —Pharm. Journ., June 5, 1909, 768; from Journ. de Pharm. et Chim., *29* (1909), 428.

Liquid Surgical Soap—Formula.—Richaud recommends the following formula for a liquid surgical soap, which is more frothy and penetrates more easily into the interstices of the skin than the ordinary white soap commonly employed: White soap, 1,000; soft soap, 1,000; poppy-seed oil, 500; water, 3,000. The white soap is scraped, mixed with the other ingredients, and the whole heated to form a paste, to which is added glycerin, 50; betanaphthol, 50; alcohol (90 per cent.), 500; oil of lemon, 50; water, sufficient to make 15.000.—Pharm. Journ., July 4, 1908, 8; from Précis de Therap. et de Pharmacolog., through Rep. de Pharm., 1908, 265.

Soft Soap—New Formula.—I. V. Stanislaus recommends the following formula for the expeditious preparation of a soft soap without heat: Place 300 Gm. of linseed oil in a strong, capacious bottle, add 61 Gm. of solution of potassium hydroxide (U. S. P.), 122 Cc. of alcohol, and 150 Cc. of distilled water, and agitate the mixture vigorously until saponified. This soft soap can be used for a variety of purposes, for example, a

Liquid Soap for Toilet Use, as follows: Soft soap, 350 Gm.; alcohol, 150 Cc.; tincture of cudbear, N. F., 15 Cc.; oil of sweet orange, oil of lavender flowers, oil of bergamot, and oil of cinnamon, of each, 8 Cc., and water, sufficient to make 1000 Cc. mix in the order named, shake and filter. Another convenient use of this soft soap is for the preparation of

Compound Solution of Cresol, U. S. P.: Take of this soft soap, 350 Gm.; distilled water, 150 Cc. Place these upon a water bath and stir until homogeneous; then add 500 Gm. of cresol, U. S. P., stir until liquid, remove from the heat and bottle.—Proc. Penna. Pharm. Assoc., 1908, 162–163.

SPIRITUS.

Spirit of Nitrous Ether—Short Method of Preparation.—D. B. Dott proposes a method of preparing spirit of nitrous ether which is based on the method official in the U. S. P., but is more direct, and shortened by the avoidance of washing the ether produced. Moreover, it is adapted to very small quantities, so that it may be made fresh at short notice. It is as follows: 12 fl. ozs. of rectified spirit and 5 fl. ozs. of absolute alcohol are mixed with 158 grs. of sulphuric acid, and ½ ounce of sodium nitrite dissolved in 5½ fl. drachms of water is added to the acidified alcohol in a stoppered bottle. After thorough cooling, filter through paper, and wash salt on the filter with 6 fl. ozs. of rectified spirit. The object of using absolute alcohol is to keep down the specific gravity to the B. P. requirement. The product obtained in the recorded experiment was nearly, if not quite, neutral, had the sp. gr. 0.843, and yielded from 5 Cc., by the official test, 39.5 Cc. of NO.—Pharm. Journ., Mar. 27, 1909, 429.

Hoffmann's Anodyne—What Should be Dispensed When it is Demanded

over the Counter?—The elimination of the synonym "Hoffman's Anodyne" for Compound Spirit of Ether from the U. S. P. VIII, gives rise to the question "is it necessary to dispense U. S. P. Compound Spirit of Ether when Hoffmann's Anodyne is called for over the counter," which George M. Beringer endeavors to answer. He says, while officially and legally no preparation may be now designated as Hoffmann's Anodyne, he assumes the position that the pharmacist has ample documentary evidence before him to prove that this name should be used solely as a synonym for the official compound spirit of ether and that alone should be meant and supplied. The fact that spurious articles have for many years been prepared and sold under this name does not justify a continuance of this practice nor warrant the manufacturers continuing the application of a name so long official to a product of different composition from that to which it was officially applied. The repeated declarations of the previous revisions of the Pharmacopœia that Hoffmann's Anodyne is a synonym for Spiritus Ætheris Compositus should have been long ago accepted by both pharmacist and manufacturer as an authoritative decision binding upon them to follow.—Proc. Penna. Pharm. Assoc., 1908, 213–216.

Essence of Peppermint—What Should be Dispensed.—Geo. M. Beringer observes that if he were to answer the query, "When essence of peppermint is called for is it customary to consider it a synonym for the U. S. P. Spirit of Peppermint?" categorically in accordance with his own practice, it would be in the affirmative, and he believes that this custom should prevail throughout the entire trade. But while in the revisions of the U. S. P. 1870, 1880 and 1890, "essence of peppermint" was given as an English synonym for Spiritus Menthæ Piperitæ, in the Eighth Revision, this synonym was dropped. Moreover, the government has established a legal standard for peppermint extract, "as the flavoring extract prepared from the oil peppermint, or both, and contains not less than three (3) per cent. by volume of oil of peppermint." But this is not intended for the medicinal "essence of peppermint," for which (since it has been dropped as a synonym) no legal standard now exists, and the public must depend upon the honesty of the manufacturer and vendor for manufacturing the same strength as formerly officially determined. The honest pharmacist, who needs no law, will accept Spirit of Peppermint, U. S. P., as the standard for essence of peppermint, and dispenses it only, while with the dishonest it is now optional to sell any peppermint preparation under the name of "essence."—Proc. Penn. Pharm. Assoc., 1908., 216–217.

Spiritus Saponatus.—Improved Formula, which see under "Linimenta."

SUCCI.

Fruit Juices—Methods of Preparation.—The "National Druggist" publishes a number of methods for the preparation of fruit juices which deserve more than passing attention, since they give explicit directions for their

classification, and preservation without antiseptics, and with and without preliminary fermentation.

Method of "Paper Pulp" Filtration.—Professor E. Gude permits the crushed fruit, for example, raspberries, to stand for two or three days, depending on the prevailing temperature, then presses off and lets the juice ferment for three or four days until it shows a little film on top, say as thick as cream. This is the safest sign that fermentation is over with, but it demands an immediate and rapid filtering, as otherwise decolorization sets up. A filtration undertaken in the ordinary way with funnels, etc., demands a good deal of time and trouble, and occasions a loss from evaporation. He uses a bolter of gray linen, not too thick, about 30 Cm. broad and 60 Cm. long (12 inches wide by 24 long), spread on hooks, and a so-called "bock"—two longitudinal scantling bound together by cross pieces, 12 Cm. (4.8 inches) thick and 125 Cm. (50 inches) long, resting on feet about 40 inches high. If, for example, we have 50 kilos of juice to filter, the author would take a book of good filtering paper, tear it apart, pour hot water over the pieces, let them soak a half hour, then press the mushy paper on the surface of a straining cloth with his hands. The mass he then puts in a pot of some 60 liters and pours over the same some two liters of the juice, carefully skimmed from the vat, which he stirs into a sort of broth, on which he adds to the whole of the juice above the layer, and stirs it into a homogeneous mass. As is well known, the pectin bodies which constituted the analogue to gelatin in fruits, undergo a conversion, by a ferment present in the fruit itself, into metapectinic acid, etc., which precipitates as a dirty, reddish scum, while the liquid clears up. In order that this pectin mass shall not again trouble the juice after fermentation is ended it is carefully removed into another vessel. The juice containing the paper is now poured all at once into the bag (*Spitzbeutel*), and as quickly as it runs through returned to it until it finally makes its appearance perfectly limpid and clear. Hereupon another pot is put beneath; the pot containing the strained juice is put on the "bock" and a syphon (consisting of two pieces of glass tubing, a longer and a shorter, from a third to four-tenths of an inch in diameter, connected with bits of gum tubing) placed in the upper pot and made to deliver the juice in the center of the bag. The paper deposits itself quite evenly on the walls of the bag, and so produces a filter, but if the liquid is not kept on top, or if it presses on the bag, the paper would fall in a mass in the middle and thus make the juice muddy. After a longer or shorter time the longer leg of the syphon must be replaced by one with a smaller diameter. In the course of two or three hours the 50 kilos of juice have been filtered, yielding 40 kilos of limpid liquid.

Preservation Without Antiseptics.—Rudolph Steiner submits the clarified juice (which is obtained by essentially the preceding method) to

boiling in copper kettles. It is then drawn off into bottles or demijohns, hot, if possible, and these are stored in a cool cellar. While the juice is boiling, the scum that rises to the surface—the so-called plant albumen—must be removed as it rises. The containers should be well stoppered. Juice thus prepared will keep and retain its natural color, odor and flavor for several years. It will stand transportation for short distances, but where the journey is prolonged the addition of 6 per cent. alcohol is recommended.

Unfermented Fruit Juices, which are quite free from alcohol, may be prepared satisfactorily according to Professor Mueller, as follows: The freshly expressed juice is poured through an ordinary kitchen sieve to free it from coarser impurities, and filled into ordinary claret bottles. These must not be quite full, however, as then they are apt to burst, no matter how carefully they are heated. They are closed with scalded corks, well-fitting and tied to place with a champagne knot. These bottles are now placed in a commodious kettle, straw being placed between them, and water poured into the kettle, up to the level of the liquid in the bottles. The temperature is gradually raised to 70° C. (158° F.), and kept at this point for half an hour, not being allowed to get much higher, as the liquor will take on a "cooked" taste that is very disagreeable. After testing allow the bottles to stand in the kettle until they can be taken out with the naked hand. The impurities, etc., in the liquid have coagulated and fallen to the bottom, and the liquid may now, or in a short time thereafter, be poured off perfectly limpid, and if the "wine" is intended for sale at the counter, by the glass, it may be decanted directly from the bottle. If it is to be sold by the bottleful or dozen bottles, it should be filtered, and if the juice is not soon consumed it will have to undergo a second "pasteurization," or boiling, after which it will keep indefinitely, or until it is uncorked. Even an opened, or uncorked, bottle will keep four or five days.—Nat. Drugg., March, 1909, 88.

Lemon Juice—Extraction by Centrifugating.—B. Stock states that lemon juice is now prepared by centrifugating the pulp, and that the juice so obtained is better in flavor, since none of the seeds are crushed; it is also clearer, and the residue is easier to handle than the press cake obtained by the older method.—Pharm. Journ., April 10, 1909, 494; from Journ. de Pharm. et Chim., *29* (1909), 163.

Lemon Juice—Determination of Quality.—Concluding a lengthy paper on the examination of lemon juice, E. Frisch mentions the following essentials for estimating its proper quality. Freshly pressed lemon juice has a greenish-yellow color, which darkens on keeping, assuming gradually a more and more brownish tinge. Its peculiar fruit-aroma has scarcely any resemblance to the aroma of the rind; the taste also is characteristic and, after some experience, cannot be confounded with that of solution of citric

acid. The citric acid content fluctuates from 5.0 to 8.0 Gm. in 100 Cc. of the juice, the extremes in either direction, high on the one hand and low on the other, being seldom found in normal juices—although, in isolated cases, as low value as 4.3 Gm. citric acid has been found. In fermented juices, or such containing alcohol as preservatives, as much as 0.5 Gm. of the citric acid may be consumed in esterification; but in most cases a connection of 0.1 Gm. as $C_6H_8O_7$ suffices. The mineral constituents fluctuate from 0.38–0.59 Gm. in 100 Cc.; their alkalinity, from 0.5 to approximately 8.0 Cc. 1/1 normal acid. The nitrogen content fluctuates considerably—from 0.055 to 0.093 in 100 Cc. The extractive, remaining after the deduction of sugar, glycerin, acid, mineral matter and acid combined with the latter, is mostly from 0.4–1.0 Gm. in 100 Cc., while artificial juices often show no extractive at all. In judging the quality of a sample, the values found of mineral matter, alkalinity of same, of nitrogen, and of extractive, are important factors.—Arch. d. Pharm., *246* (1908), Nos. 6 and 7, 472–484.

Papau Juice.—Powerful milk-curdling property of the zymnase present. See *Zymase of Carica Papaya* under "Albuminoids."

Succus Rubi Idæi—Method of Preparation.—Harold Wyatt recommends a formula for raspberry juice for inclusion in a future edition of the "B. P. Codex," as being particularly useful in making elixirs and other elegant products of modern pharmacy. A juice of very fine flavor may be obtained by allowing picked raspberries to ferment in a lightly-covered jar for three or four days, until carbonic acid gas is coming off briskly, and a light green mould has nearly covered the exposed surface of the top layer of berries. Remove the mould carefully and the fruit beneath to the depth of an inch, then turn all out on a muslin strainer. When the juice ceases to drip, gently squeeze out the remainder, and heat on a water-bath to 90° C., filter, and to the cooled juice add 25 per cent. of alcohol. If it is desirable to avoid heat, add one-third alcohol to the juice after straining, and filter after seven days standing.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 446.

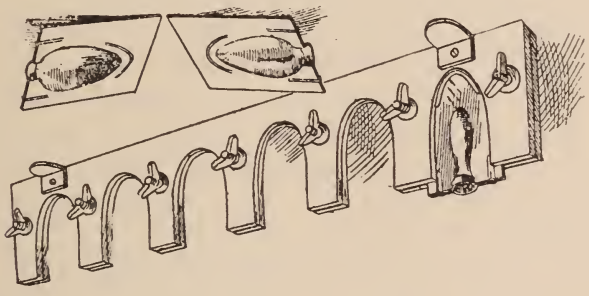
SUPPOSITORIÆ.

Suppositories—Preparation by the Cold Process.—A. Schleimer gives the following simple directions for making suppositories by the cold process, which he regards as vastly superior to the older process of heating and melting: The cocoa butter should be grated with an ordinary grater such as used in the kitchen. This is easily accomplished by placing both the butter and grater on ice and leaving them there for at least fifteen minutes. It is an easy matter then to handle the butter, as the colder it is the more brittle it becomes. It is easy to keep a quantity of the grated material on hand by keeping it in the ice-box in the summer time, and in a cold place in the winter. It will easily remain loose and not run

together as long as it is kept cool, and then you always have it ready when required. When wanted for use, weigh out the desired amount and after placing it in the mortar add about 5 per cent. of castor oil and then the powdered ingredients. Work it up to a mass just as you would for pills, and, if necessary, heat the pestle to facilitate matters. When the mass is about the same consistency as a soft pill mass, it can be taken out, rolled on a pill machine to the proper length, divided with the machine or with a spatula, and each one pressed into the mold. The best and handiest mold for the purpose is the hinged brass mould usually made for six or twelve suppositories. After the mass is once cut into pieces of the proper length, it is a simple matter to finish them at your leisure, as each one can easily be softened to the proper consistency by the heat of the hand.—National Drugg., Feb., 1909, 54.

Suppositories—A New Mould.—Under the name of "Cygnet Suppository Machine," the novel form of suppository mould shown by Fig. 54 is

FIG. 54.



Suppository Mould.

supplied on the London market. It consists of flat metal plates so pressed as to form a mould for the suppository or penary when two are joined and clamped into the rack or support by means of thumb-screws. This support accomodates six moulds at a time, which are easily put in position after slightly loosening the thumb-screws—this position being indicated by marks on the sides of the plates. Cooling is effected by means of water or ice in a long tin bath, into which the mould-support is fitted. The plates are supplied in four sets, to produce different shapes and sizes of suppositories.—Chem. & Drugg., Oct. 24, 1908, 645.

SYRUPI.

Syrups of the U. S. P. are criticised in detail by E. Fullerton Cook in a paper printed in the "Proceedings" of this Association, 1908, 951–963.

Official Syrups—Manipulation.—Wm. Mittelbach makes some practical suggestions concerning the general method of making the official syrups.

Instead of straining the syrup near the end of the process and then adding enough water through the strainer to make the requisite amount, reverse the order by adding water enough first and then straining. The final act of the process of adding the washings from the strainer may be the cause of the early decomposition of some of the official syrups.—Proc. Mo. Pharm. Assoc., 1908, 97.

Medicated Syrups—Preservation with a Layer of Paraffin.—J. Lorengen has recently recommended that medicated syrups be preserved by filling them into w. m. bottles nearly to the top of the neck, and then pouring on a 3 per cent. solution of salicylic acid in paraffin. G. Arends finds the method a good one, but considers the use of salicylic acid superfluous. It exerts no preservative action on the syrup, and the paraffin needs no preservative. To succeed well the sides of the neck above the syrup should be *perfectly dry* and should be expanded slightly outward so that the paraffin stopper formed may be readily removed. Moreover, the paraffin must not be hot when poured on the syrup, but just sufficiently warm to retain its molten condition while pouring.—Pharm. Ztg., liii. (1908), No. 67, 656.

Syrupus Aurantii.—P. Henry Utech suggests an improved formula in the "Proceedings" of this Association, 1908, 950.

Syrup of Ferrous Iodide—Volumetric Estimation.—E. Rupp and W. Schirmer recommend a method for the volumetric estimation of ferrous iodide in the syrup, which is based upon the following reactions: The ferrous iodide is decomposed with an excess of ferric chloride, which occurs according to the equation: $FeI_2 + 2FeCl_3 = 3FeCl_2 + I_2$. The excess of ferric chloride is then converted by phosphoric acid into phosphate, and the liberated iodine, after addition of a little potassium iodide, is titrated with sodium thiosulphate. The method is conducted as follows: 5 Gm. of syrup of ferrous iodide is weighed into a glass-stoppered flask of 150–200 Gm. capacity, and having a fairly large mouth, carefully avoiding contact of the syrup with the neck and walls of the flask; then 4 Gm. of liq. ferri sesquichlorati are added and mixed with the syrup by gentle rotation. After standing 1–1½ hours, the contents of the flask are diluted with 100–120 Cc. of water, 10 Cc. of phosphoric acid are added, mixed by rotation, and the liberated iodine is then dissolved by the addition of 0.5–1 Gm. of potassium iodide. As soon as this is effected the solution is titrated with $\frac{N}{10}$ thiosulphate solution until colorless—1 Cc. of the latter corresponding to 0.0155 Gm. FeI_2. The process must be conducted strictly in the sequence directed, and must be concluded with celerity after the addition of the water, since the reaction is reversible if the contact with phosphate is prolonged beyond certain limits. Comparison with other methods proves the proposed method to be very serviceable and free from the objections that are inherent to some of the prescribed methods.—Apoth.-Ztg., xxiv (1909), No. 18, 160.

Compound Syrup of Glycerophosphates, B. P. C.—Improvements Suggested.—Harold Wyatt says that if the right ingredients are used, the modified formulas for compound syrup of glycerophosphates, in which acetic or glycerophosphoric acid is used instead of citric acid, as directed in the "Supplement," yield a very good syrup, except that it is somewhat too light in color, the cudbear having been reduced to one-fifth the original quantity. It is preferable to reduce the cudbear only to one-half, viz., 0.62, which should be properly extracted by boiling with 40 of water and 10 of glycerin, filtering, etc. Also, the chloroform is not a necessary ingredient, except as a flavoring, and may with advantage be replaced by orange flower, vanilla or rose. Furthermore, the author proposes that

Syrup of Glycerophosphates with Formates be modified by substituting 4 parts of formic acid (25 per cent.) for acetic acid, adding 10 per cent. of glycerin, and using 6 per cent. of undiluted orange flower water and 3 per cent. of cherry laurel water.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 447.

Compound Syrup of Glycerophosphates—Improved Formula for B. P. C., 1908.—After a critical review of the B. P. C. formulas of 1895, 1901 and 1907, for compound syrup of glycerophosphates, John Humphrey and Frank Goldby submit the following improved formula for inclusion in the B. P. C. Formulary of 1908:

Calcium glycerophosphate	2.00
Potassium glycerophosphate	1.00
Sodium glycerophosphate	1.00
Magnesium glycerophosphate	1.00
Solution of iron glycerophosphate	10.00
Glycerophosphoric acid (20 per cent)	5.00
Caffeine	0.50
Strychnine	0.024
Glycerin	20.00
Refined sugar	40.00
Tincture of cudbear	3.00
Stronger chloroform water (1 in 200), sufficient to produce	100.0

Triturate the calcium, potassium, sodium, and magnesium, glycerophosphates with the glycerin, mixed with 25 of stronger chloroform water, and add the solution of iron glycerophosphate; then dissolve the caffeine and strychnine in the glycerophosphoric acid, by the aid of gentle heat if necessary, mix the two solutions, dissolve the sugar in the mixed liquids without the aid of heat, add the tincture of cudbear, make up to 100 by volume with stronger chloroform water, and strain or filter if necessary.

The syrup thus prepared, though somewhat paler than its predecessors, is of a brilliant red color; it is faintly acid, agreeable to the palate, and shows no tendency to deposit.—Pharm. Journ., Oct. 24, 1908, 512.

Iodized Syrup of Horseradish, Ph. Fr.—Faulty Formula.—The new

French Codex directs that syrupus cochleariæ armoraciæ iodatum be prepared by the admixture of 10 Gm. tincture of iodine with 990 Gm. syr. cochlear. armorac. comp., and remarks that the iodine is combined after 24 hours. Lemaire, however, finds that after 24 hours considerable quantities of iodine remain uncombined, and regrets that the new Codex fails to specify the exact condition of the iodine—whether free or in organic combination—in the finished syrup.—Pharm. Ztg., liv (1909), No. 35, 345; from Rép. de Pharm., 1909, No. 4.

Syrup of Hypophosphites and Syrup of Calcium Lactophosphate are critically discussed in a paper printed in the Proceedings of this Associa- 1908, 869–874.

Syrup of Lactucarium, U. S. P., VIII—Addition of Alkali.—To set free the trace of hyoscyamine which lactucarium is said to contain, and to hold in solution any caoutchouc and resin retained by the tincture, I. V. Stanley Stanislaus recommends the following modification of the official formula for syrup of lactucarium: Tincture of lactucarium, 100 Cc.; solution of potassium hydroxide (U. S. P.), 20 Cc.; orange flower water, 50 Cc.; syrup, sufficient to make 1000 Cc. Mix in the order stated.—Proc. Penna. Pharm. Assoc., 1908, 162.

Compound Syrup of Phosphoric Acid—Formula.—Adolph Marquier suggests the following formula for a syrup containing a considerable quantity of uncombined phosphoric acid in addition to the phosphates usually prescribed in compound syrups of phosphates:

Phosphoric acid (85 per cent.)	50.0 Cc.
Potassium phosphate	30.0 Gm.
Calcium phosphate	12.0 Gm.
Magnesium phosphate	18.0 Gm.
Iron phosphate	2.0 Gm.
Quinine hydrochloride	4.240 Gm.
Strychnine	.120 Gm.
Simple syrup, sufficient to make	1000.0 Cc.

Dissolve the magnesium, calcium and potassium phosphates in the phosphoric acid, and the strychnine in a little distilled water, say about 8 Cc., to which a little phosphoric acid has previously been added. Then dissolve the quinine hydrochloride in some simple syrup, and the iron phosphate in 15 Cc. of distilled water. To the solution of magnesium, calcium and potassium phosphates add the quinine solution, then the strychnine solution, the iron solution, and finally sufficient simple syrup to bring the volume up to 1000 Cc. This preparation can be given a reddish-brown color with a few drops of caramel, if desired, a reddish with cudbear tincture, if so wanted. The dose usually recommended is 4 to 8 Cc. 3 times a day for adults.—Proc. N. J. Ph. Assoc., 1908, 50.

Syrup of the Phosphates of Iron, Quinine and Strychnine—Unsatisfac-

tory Formula of the U. S. P.—Wm. K. Ilhardt finds that the glycerite from which the syrup is directed to be prepared does not turn out a permanent solution when the official directions are closely followed. In two or three days crystallization commences and soon the preparation (the glycerite?) is a solid mass. He has found that if the glycerin is reduced and the water increased, a permanent solution is obtained, but even when mixed with syrup to make the U. S. P. syrup, an unstable preparation is obtained that precipitates in less than a week.—Proc. Mo. Pharm. Assoc., 1908, 93.

Syrup of Thyme—Formula.—Wippern recommends the following formula for preparing syrup of thyme, a preparation which is regarded with favor by physicians and patients for the treatment of catarrhal affections and whooping cough: 900.0 herb. thymi conc. are thoroughly imbued with a mixture of 700.0 alcohol and 200.0 glycerin in a well covered enameled basin, and set aside several hours. Then 2 kgm. cold distilled water are added and the mixture is thoroughly kneaded with the hands. The well-covered basin is then allowed to stand 4 to 5 days, at a moderate temperature, the maceration being facilitated by kneading twice daily, the mixture is subjected to expression, collecting the expressed liquid in a flask and, after subsidence, the liquid is filtered through paper in a porcelain funnel, which must be well covered. The yield is about 3000.0 filtrate, in which sufficient of the best powdered sugar is dissolved, either cold or with little heat, to make the syrup weigh 6.3 kgm. To improve the odor 9 drops (exactly) of volatile oil of thyme, triturated with 20 Gm. of sugar, are then dissolved in the syrup. So obtained, syrup of thyme represents one-seventh of the weight of the herb (= 1 : 7), contains 11 per cent. alcohol, and is perfectly stable.—Apoth. Ztg. (1909), No. 3, 25.

TABLETTÆ.

Compressed Tablets—Practical Directions for Prescription Quantities.—A. Schleimer gives the following practical directions for preparing compressed tablets, using for this purpose the steel compressor ordinarily supplied by sundry houses and consisting of a small steel cylinder with an elongated plunger and a small base. In weighing out the ingredients for the tablet, replace 3 per cent. of the vehicle (in most cases sugar of milk) with cacao butter. Place the cacao butter in the mortar first and triturate until soft to the consistency of a paste. Gradually add the sugar of milk until it has entirely absorbed the fat, then add the other ingredients and incorporate thoroughly. To use the machine dust the cylinder, the end of the plunger and the base with fine talcum powder, and weigh out the amount for one tablet. Insert the base in the cylinder and pour the powder into it. Strike the cylinder sharply on the side with the spatula in order to settle the powder in the cylinder, holding it firm so as not to dislodge the base. Place the plunger in the cylinder, and when it

rests on the powder, turn it lightly without pressure. Hold the cylinder firm and strike the head of the plunger with a hammer very lightly. This is where you generally have trouble, as the blow must be so adjusted that the tablet will just be compressed, a greater force causing the tablet to stick and making it impossible to remove without breaking. Too hard a blow will not only result in the loss of the tablet, but the compressor will have to be thoroughly cleaned again, necessitating a great loss of time. Little more than the weight of the hammer is needed in order to make a perfect tablet. Nothing but experience can tell you just how heavy a stroke to use, but it is best in experimenting to see how light a stroke you can use, instead of how heavy a one, and it will not be long before you have it just right. Once you have acquired the "knack," you can turn out tablets continually without any trouble, and you can make twenty-five or fifty in less time than it takes to make the same number of pills, without having a single miss or a broken one.—National Drugg., Feb., 1909, 54.

Tablets—Rule Governing the Rate of Disintegration.—Citing several cases in his recent experience, in which tablets of very soluble substance were found to disintegrate more rapidly when the soluble substance was combined with a sparingly soluble substance, George M. Beringer, Jr., infers that a more or less fixed rule applies in all cases where a tablet is composed of two or more ingredients; namely, that, other things being equal, *the rapidity of disintegration of a tablet varies directly with the difference in solubility of the ingredients.* The more soluble particles being first attacked by the solvent, a sort of "honey-combing" effect is produced, and the tablet falls rapidly to pieces.—Proc. N. J. Pharm. Assoc., 1908, 48–50.

Tablets Containing Chloroform — Assay and Relative Stability.—Edwin Dowzard, experimenting on a method for determining the quantity of chloroform present in certain lozenges, finds that when present in alcoholic solution in a quantity not exceeding 0.1 Gm. chloroform can be determined by boiling in a flask under a vertical condenser with an alcoholic solution of potassium hydroxide. After cooling, the liquid is neutralized (with calcium carbonate, free from chlorides) and the chlorine determined by titration with standard silver nitrate solution. Explicit details for carrying out the process are given. The lozenge must not be powdered, however, since that occasions a considerable loss of chloroform by evaporation. As to the practicability of exhibiting chloroform in tablet form, the author finds that with the excipient ordinarily used for white lozenges, they do not keep well, while the brown lozenges, containing licorice, will keep well for a considerable time. Thus white lozenges, containing originally 1.11 per cent. chloroform in a sugar base, contained only 0.15 per cent. after a month's exposure in card-board boxes at room

temperature, whereas lozenges containing 1.12 per cent. in a licorice base assayed 1.10 per cent. after keeping a month under identical conditions. A well-made chloroform and licorice lozenge, moreover, may be heated for some time at 100° C., and still retain a considerable proportion of chloroform. The average loss of chloroform in process of manufacture appears to be about 50 per cent. Furthermore, lozenges containing up to 3 per cent. of chloroform do not vary much, but over that figure variation is likely.—Amer. Journ. Pharm., Nov. 1908, 511–514.

TINCTURÆ.

Official Tinctures—Uniform Strength on a 10 per cent. Basis.—Wm. Mittelbach, speaking commendably of the action of the Committee of Revision in placing the official tinctures of potent drugs on a 10 per cent. basis, says that the committee should have gone a step further, and placed all the tinctures, with one exception (camphorated tincture of opium) on the same basis of strength. Tincture of musk should be eliminated entirely from the official list. Tincture of belladonna should be made from the root. The compound tinctures containing two or more active ingredients should contain 10 per cent. in all, and if an aromatic or corrective is included in the formula, this could be in addition to the 10 per cent. of active ingredients.—Proc. Mo. Pharm. Assoc., 1908, 97–98.

Standardized Tinctures—Can they be Prepared from Assayed Drugs without Subsequent Assay of the Products.—Chas. E. Vanderkleed and L. Henry Bernegau communicate the character and results of a series of investigations, undertaken with the object of ascertaining whether it is practicable to prepare uniform, and therefore standardized tinctures, from assayed drugs, without assaying the finished products. The results obtained show that great variation in strength of finished preparations as compared with the crude drug assays, are often obtained, and that it is not safe to accept without verification, the reputed "assayed" strengths of crude drugs as stated on labels. It follows, therefore, that uniform and standardized tinctures cannot safely be prepared from the "assayed" drugs on the market, without assaying and standardizing the finished product.—Proc. Penn. Pharm. Assoc., 1908, 176–180.

Tinctures—Test for Presence or Absence of Chlorophyll.—Richeau and Bidôt's method of distinguishing between tinctures prepared from drugs containing chlorophyll and those free from chlorophyll consists in diluting a few drops of the tincture with water until a colorless liquid results, and then carefully superimposing a few drops of ammonia. In the presence of chlorophyll, a green-yellow color is developed at the contact zone, and on shaking a yellowish liquid is produced. Muschinski, however, finds that this test is not uniformly reliable. Tincture of eucalyptus, for example, produces a rose color, tincture of galls, and the tinctures of valerian, of

gentian and of convallaria (root), produce a yellow color, although they are not prepared from plant substances containing chlorophyll.—Pharm. Ztg., liii (1908), No. 80, 786; from Farm. Journ., *47* (1908), 437.

Tincture of Aconite—Modification of the Netherl. Pharm. Process for the Alkaloidal Assay.—P. de Myttenacre has obtained good results by the following modification of the process of the Dutch Pharmacopœia for the determination of alkaloids in tincture of aconite: One hundred Gm. of the tincture are evaporated on a water bath to 15 Cc., six drops of 10 per cent. sulphuric acid are added, the capsule rinsed with sufficient water to make 20 Cc., and the liquid is filtered; 10 Cc. of the filtrate are then shaken one minute with 30 Cc. of ether and 4 Cc. of solution of ammonia, 3 Gm. of powdered tragacanth added, and the whole well shaken. Now, 20 Cc. of the ethereal liquid (representing 33.3 Gm. of the tincture) are distilled, the residue is dissolved in a little alcohol, 10 Cc. of $\frac{N}{100}$ hydrochloric acid added, and the excess titrated with $\frac{N}{100}$ solution of sodium hydroxide, using iodeosin as indicator, which gives a very distinct rose tint. Each Cc. of acid consumed corresponds to 0.00645 of alkaloid.—Pharm. Journ., July 18, 1908, 56; from Ann. de Pharm. d. Louvain., through Rep. de Pharm., 1908, 266.

Tincture of Eucalyptus—Hæmostatic Value.—Dr. A. Todd-White observes that the great value of tincture of eucalyptus as a hæmostatic does not appear to be generally recognized. It is most useful in minor operations where the effects of adrenine are transitory, and therefore dangerous. It has been found effective for persistent hemorrhage after dental extraction, for cuts of the extremities, and for persistent bleeding from leech bites, being quickly successful after the other usual remedies had failed. It is considered that the internal administration of calcium chloride, with the external use of tincture of eucalyptus, would arrest any form of hemorrhage.—Pharm. Journ., July 25, 1908, 82; from Brit. Med. Journ., 1908, *2*, 81.

Tincture of Hyoscyamus—Preparation from Fresh Herb.—E. W. Pollard prepared a tincture from fresh hyoscyamus, which grows luxuriantly in a few spots in the Isle of Wight, following the method proposed by John Barclay some years ago (see Proceedings, 1902, 769). About 7 lbs. of the herb was collected in June, and, after removal of the stalks and partial drying from a day or two's exposure, weighed 4 lbs. and contained 80 per cent. of water; to this 2½ pints of alcohol (90 per cent.) was added, and the whole macerated for a week, then pressed. To the marc 1½ pint of alcohol (45 per cent.) was added, and the mixture pressed again. The resultant tincture measured about 5½ pints, the comparatively high loss being due to the use of a rather small press. It had sp. gr. 0.956, and yielded 2.9 per dent. of extractive. The aroma and color were incomparably superior to the official tincture, and the tincture keeps

much brighter and "cleaner" than the B. P. preparation, there being practically no deposit on the sides of the dispensing-bottle. The dried herb yielded 0.16 per cent. of alkaloid.—Chem. & Drugg., Sept. 5, 1908, 388.

Tinct. of Iodine, U. S. P. VIII—Stability.—The observation of La Wall that tincture of iodine made by the U. S. P. formula of 1890, with alcohol and iodine alone, rapidly loses iodine in keeping under the ordinary conditions of the shop (see Proceedings, 1907, 156–159), while the tinctures made by the formula of the U. S. P. VIII possesses perfect stability under the same conditions, led Theo. D. Wetterstroen to undertake a series of experiments which practically confirm the observations of La Wall. He finds, however, that the decomposition of the 1890 preparation is not as far reaching as has been found by La Wall, the loss of iodine in the course of 8½ months being only 13.9 per cent. as against 40 per cent. in 3 months found by La Wall. On the other hand, basing his observations on 19 specimens of tincture of iodine prepared according to the U. S. P. VIII by as many different pharmacists, assayed when first prepared and again when the shop bottle was nearly empty, the author found in almost every instance a gain in iodine strength—this, with three exceptions, amounting to from 0.5 to 5.35 per cent., while a slight loss (0.44 and 0.7 per cent.) was observed in only two of the samples. The time of keeping in the shop, under ordinary conditions until nearly consumed, varied from 98 to 286 days—the latter showing also the largest increase (5.35 per cent.) This increase the author attributes to the evaporation of a portion of the alcohol.—Proc. Ohio State Pharm. Assoc., 1908, 52–53.

Tincture of Iron Citro-Chloride, N. F.—Modification of Formula.—Dr. E. H. Squibb suggests the following modification of the N. F. formula for tincture of iron citro-chloride:

Solution of ferric chloride, U. S. P.	350 Cc.
Potassium citrate	390 Gm.
Alcohol	157 Cc.
Water, q. s. to make	1000 Cc.

In his experience the substitution of potassium citrate for the sodium salt prescribed in the N. F. formula prevents the crystallization commonly complained of in making elixir of iron, quinine and strychnine.—Bulletin A. Ph. A., Sept., 1908, 280.

Tincture of Opium—Preparation by Percolation.—Möller, mentioning the international agreement of 1902 (Brussels Conference) that tinctures of heroic drugs shall be made *by percolation* in the proportions of 1 : 10, points out the difficulties encountered when the process of percolation is applied to opium in the preparation of the simple tincture or of tinct. opii. crocata. He has worked out the process for these tinctures for the Danish Pharmacopæia of 1907, in which he directs the simple expedient of mix-

ing the opium (granulated ? Rep.), with twice its weight of well-washed sand. The mixture may be percolated at once and preliminary maceration is not necessary. This process has been adopted also in the Swedish Pharmacopœia of 1908.—Pharm. Ztg., liv (1909), No. 44, 435; from Ber. d. D. Pharm. Ges., 1909, No. 4.

Tincture of Opium, U. S. P.—Efficiency of the Official Process.—Wm. T. Hankey has caused a series of experiments to be made with the object of determining the relative efficiency of the official process of extracting the opium—preliminary maceration with boiling water, addition of alcohol equal in volume to that of the water and percolation—and of direct maceration with diluted alcohol for two weeks with daily maceration. Parallel experiments were also made, using 10½ parts of opium instead of 10 parts officially required, to determine the advantage, if any, by this procedure to compensate for incomplete extraction of the opium assay to contain the official percentage of crystallized morphine (12 to 12.5 per cent.). The results, which are shown in the table giving the details of each series of experiments, demonstrate that the official process in the hands of careful workers will give more uniform results than the direct maceration process with diluted alcohol. Furthermore, that there is no advantage in increasing the quantity of opium from 10 to 10.5 parts, since even when the process of extraction is most carefully conducted, the tincture must be standardized by assay. In other words, it is not practicable to rely upon the uniform extraction of the morphine so as to produce a tincture of the official strength by extracting the assayed opium with a definite calculated quantity of the menstruum. Moreover, the experiments have shown that the yield of morphine by the official assay will vary with the temperature at which its crystallization is effected—the average yield at 27° C. (80° to 82° F.), being 11.86 per cent., while at 22° C. (70° to 72° F.), it was 12.40 per cent. It might be desirable, therefore, to be a little more explicit and to define what is meant by a moderately cool temperature.—Proc. Ohio State Pharm. Assoc., 1908, 47–49.

Tincture of Opium—Important Point to be Observed in the Assay.—Geo. D. Beal calls attention to the following points to be carefully observed when assaying tincture of opium by the official process. The first is the evaporation of the sample. The Pharmacopœia directs the first concentration to be conducted upon a water-bath, but all subsequent evaporations are to be made at a "gentle heat," without specifying the temperature or the manner of applying the heat. In the author's opinion this should always be done on the water or steam-bath, and he demonstrates experimentally that if the evaporation is conducted on a sand-bath, and more so on wire gauze, there is an invariable loss of morphine by decomposition. The second point is in the washing of the extract from the capsule. The water should be added gradually and the stirring so

thorough as to disintegrate the flakes, and for this purpose the tip of the little finger is better than a stirring rod. The third particular point is the precipitation. The pharmacopœial injunction to shake well for ten minutes after the ammonia has been added must be carefully obeyed—the shaking vigorous and continuous—otherwise the morphine crystals formed will be large, dark colored, and persistently so; whereas, with sufficient shaking, light colored, almost white crystals are formed, which are easily washed and dried. The fourth point which needs to be considered is the treatment of the morphine with lime water, which must be exposed as little as possible to the air to prevent the formation of carbonate. With care, however, keeping the flask well stoppered while dissolving the morphine and covering the funnel while filtering the amount of carbonate formed and retained on the filter as residue will be too small to be appreciable.—Proc. Ohio State. Pharm. Assoc., 1908, 50–51.

Tincture of Strophanthus—Conditions Necessary to Secure a Uniformly Reliable Preparation.—In view of the opinion expressed by several observers that the tincture of strophanthus has been of variable activity, and also considering the present dependence of the retail pharmacist upon the large manufacturing houses for standardized tinctures, Dr. Archibald E. Chase has made a comprehensive series of investigations to devise a means whereby the retail pharmacist can prepare the standardized tincture of strophanthus, and thus give his own guarantee for the drug which he dispenses. From the facts ascertained and described, the author feels justified to submit the following conclusions:

(1) The active principle of strophanthus is slowly extracted by the menstruum of the Pharmacopœia (about 65 per cent. alcohol), more rapidly by a menstruum having a lower percentage of alcohol. The latter makes an unsightly tincture, which may be cleared by chilling (ice and salt), and filtering while cold.

(2) Defatting the seeds aids percolation, does not effect the strength of the tinctures, and in any way eliminate the emetic action of the drug.

(3) For percolation, the moistened seeds should be firmly packed in a long, narrow percolator.

(4) Tincture of strophanthus, when made in small quantities, requires at the very least seven days of percolation with 1000 Cc. of menstruum for each 100 Gm. of seed, and to be sure of exhaustion, in addition, there should be several periods of maceration of at least eight hours each.

(5) The minimal lethal dose of such a tincture should be between one-thirtieth and one-thirty-fifth of a cubic centimeter per kilo of cat, injected subcutaneously (*i. e.*, about forty *cat-units* * per centimeter).

* A *cat-unit* is the minimal lethal dose by vein per kilo of cat. If the injection is made subcutaneously, then the minimal lethal dose will be about one-fourth greater (Hatcher and Bailey, I. A. M. A., vol. lii [1909], p. 5).

(6) To insure uniformity in the strength of the tincture, the strength of the seed should be constant. This may be easily determined by the wholesale house. Pharmacists should demand standardized seeds of the strength indicated by about 400 *cat-units* per gramme of seed.—Amer. Journ. Pharm., May, 1909, 209–215.

TROCHISCI.

Troches of the U. S. P., VIII—Possible Improvements in Formulæ.—John F. Hancock says that the formulas for troches of the U. S. P., VIII, are an improvement over those of previous revisions, both in character and indications for medicinal use, while the list although less in number, is more select. In several cases, however, the formulæ given in the U. S. P. do not compare favorably with those given in other pharmacopœias. This is especially so of tannic acid, cubeb, gambier and krameria, in the formula of which currant paste * is advised as the excipient by the London Throat Hospital Pharmacopœia. The formula for troches of ammonium chloride, U. S. P., VIII, is a decided improvement on that of the U. S. P., 1880, in that it contains extract of licorice, which improves the taste and adds to the therapeutic value. On the other hand the formula for troches of potassium chlorate is not so desirable as the one given in the U. S. P. of 1880, in that it omits the oil of lemon, which gives the lozenge a pleasant flavor. While the official troches have never attracted the attention of physicians and pharmacists to any extent, and have been very much neglected, the Pharmacopœia would be incomplete without a selected list of formulæ for them.—Proc. N. J. Pharm. Assoc., 1908, 96–97.

UNGUENTÆ.

Cerates and Ointments are critically considered by J. M. Good in a paper printed in the "Proceedings" of this Association, 1908, 972–974.

Unguentum Althææ—Preparation.—Arthur D. Watson recommends the following improved formula and process for making unguentum althææ which, as ordinarily supplied, can only be regarded as a modified resin ointment: Take 2 ozs. of marshmallow leaves and boil with a quart of water for three-quarters of an hour. Press in a tincture press, and filter the expressed liquid. Evaporate the filtrate to a thin extract, and add while warm 4 ozs. of lard, stirring vigorously. As the ointment has a tendency to become mouldy, it is recommended to make only small quantities at a time, according to needs.—Pharm. Journ., Oct. 3, 1908, 432.

* "Currant paste," both of the black and red variety of currants, forms the basis of a number of troches for which formulæ are given in the B. P. Codex, yet all we can learn about these pastes is that they are commercial products (see "Lozenges with Fruit Bases" in B. P. Codex, ed. 1907, p. 1220). I have personally endeavored for years to find out exactly what is red or black currant paste, how these pastes are prepared; but those that it was believed should know have carefully withheld the information.—Rep.

Unguentum Conii, B. P.—Improved Formula.—G. Pinchbeck finds the following formula to produce a conium ointment of definite and stable composition, and not subject to complaint on the score of becoming mouldy on keeping, as is the case when the ointment is prepared according to the B. P. from the expressed conium juice.

Ext. conii liq., 1 per cent. by weight of alkaloid	4.0
Adeps lanæ anhyd	13.0
Paraffin molle	26.0
Thymol	0.16

Reduce the liquid extract by evaporation on a water-bath to 1 by weight, and incorporate (1) the anhydrous wool fat, and (2) the soft paraffin, in which the thymol has been previously dissolved by the aid of heat. The finished preparation will contain 0.1 per cent. of the alkaloids of conium fruit.—Pharm. Journ., Jan. 23, 1909, 85.

Mercurial Ointment—Improved Method of Assay.—W. C. Johnson recommends the following simple and expeditious method of determining the mercury in mercurial ointment: A small weighed amount of ointment is dissolved in warm petroleum benzin, solution of potassium cyanide is added, and the mixture shaken up. Copper beads are then added, and the whole shaken together. Amalgamation, facilitated by the cyanide results, and when the mixture is thus freed from mercury the beads are taken out, washed with benzin, dried, and weighed. They are then heated to drive off the mercury, and after cooling, again weighed, the difference between the first and second weighing giving the amount of mercury in the sample. A quicker method, which obviates the necessity of driving off the mercury, consists in weighing the copper beads before adding them to the mixture, and again after washing perfectly free from fatty and other matter and drying. The increase in weight of the copper shows the amount of mercury present.—Pacif. Pharm., June, 1909, 38–39.

Mercurial Ointment—Improved Method of Assay.—Philip H. Crewe mentions that while the method of assaying mercurical ointment now official in the U. S. P., which depends on the extraction of the fatty base with a volatile solvent, gives good results, it is often difficult to obtain the mercury in the globular form, suitable for weighing. He, therefore, recommends the following method, which depends on the saponification of the fat with warm alcoholic potash and removal of the soap by treatment with hot water: About 20 Gm. of the ointment are weighed into a beaker having a capacity of 300 Cc.; 10 Gm. of potassium hydroxide and about 100 Cc. of methylated spirit are added, and the whole is warmed on a water bath until the mercury collects in globules. Hot water is next added, the solution of soap is carefully decanted, and the residual mercury, after several washings with hot water, is washed with alcohol, then with a little ether, and when this has evaporated, the mercury is weighed. If

the mercury so obtained is not perfectly bright, it should be treated with a little warm dilute hydrochloric acid to remove any impurities before it is finally washed and weighed. The results agree with those obtained by extraction with ether, the method is simpler, and the mercury is obtained in a more satisfactory form. Experiments made by the author show that the loss of mercury by treatment with alcoholic potash does not amount to more than one-tenth of one per cent. of the metal found.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 473–476.

Compound Resorcin Ointment, N. F.—Modified Formula.—Dr. E. H. Squibb suggests the following modification of the N. F. formula for preparing compound resorcin ointment which has stood the test of time and has proven quite satisfactory:

Resorcinol	6 parts.
Zinc oxide	6 parts.
Bismuth subnitrate	6 parts.
Oil of cade	12 parts.
Paraffin	10 parts.
Petrolatum	25 parts.
Anhydrous wool fat	25 parts.
Distilled water	10 parts.

Dissolve the resorcinol in the distilled water, add this to the anhydrous wool fat previously melted. To this add gradually the zinc oxide and bismuth subnitrate previously mixed and passed through a No. 60 sieve. Triturate until perfectly smooth. Incorporate with this the paraffin and petrolatum previously melted together, and lastly, the oil of cade. Mix intimately and preserve the ointment in containers protected from the light.—Bulletin A. Ph. A., Sept., 1908, 282.

Zinc Oxide Ointment—Manipulation.—John Lohmann recommends the following manipulation for conveniently preparing the zinc oxide ointment by the U. S. P. formula: Divide the benzoinated lard into three parts. Melt one portion, add the zinc oxide, heat for a short time, and strain the mixture through cheese-cloth. Heat another part of the lard, pass it through cloth, and at the same time stir the zinc oxide on the cloth. The last portion of the lard is heated and poured upon the cloth while one stirs with a spatula as before. All the zinc oxide passes through the strainer during the process. Then pour the ointment into a porcelain dish and stir until it becomes hard.—Bull. Pharm., July, 1908, 297.

"Greaseless" Cold Cream—Formulas.—I. V. Stanley Stanislaus recommends the following two formulas for preparing so called "greaseless" cold creams, either one of which gives good results—the one made with paraffin oil, the other with stearic acid as a base. The

Paraffin-oil Cold Cream is made as follows: Melt 9 pounds of white wax, add 4 gallons of white paraffin oil, and heat until the liquid clarifies;

then pour into a solution of ½ pound of borax in 11½ pints of distilled water, reapply heat and stir until snow-white. Add 3 ounces of oil of rose geranium, stir, and pour into jars.

Stearin Cold Cream is made by heating 30 Gm. of pure stearic acid with a solution composed of 20 Gm. sodium carbonate, 5 Gm. borax, 25 Cc. glycerin and 400 Cc. witch hazel water, U. S. P., in a capsule on a water bath until effervescence ceases. Then remove from the heat and when it begins to stiffen add alcohol, 30 Cc.; oil of rose geranium, 10 Cc.; mucilage of tragacanth, 100 Cc. Mix well, permit to harden, re-apply heat, beat up again until smooth and creamy, and fill in jars or tubes.—Proc. Penna. Pharm. Assoc., 1908, 163-164.

Massage Ointment or Toilet Cream.—A formula is recommended by Charlotte E. Stimson in the Proceedings of this Association, 1908, 972.

Peroxide Cream—A Summer Cold Cream.—H. D. Morgan recommends the following formula for a peroxide cream which is a very suitable "cold cream" for summer use, and actually contains hydrogen peroxide: Quince seed, ½ ounce; boiling water, 12 ounces. Make a mucilage, strain till clear, heat and add stearic acid, previously melted, 16 ounces. When thoroughly mixed add slowly 20 ounces of water in which has been dissolved borax, 1½ drachms, and sodium carbonate, 4 drachms; then, when cool, add water, 32 ounces; hydrogen peroxide, 4 ounces; alcohol, 1 ounce; perfume, q. s., and mix sec. art.—Pacific Pharm., May, 1909, 6.

VINA.

Beef, Wine and Iron—Examination of Commercial Samples and Criticism of N. F. Formula.—John Phillips Street has examined 92 samples of beef, wine and iron obtained from the stock of Connecticut druggists, with results which indicate certain important objections to the method of preparation recommended in the last National Formulary. The results demonstrate the fact that, when the procedure of the Formulary is adhered to, there is a loss of 29 per cent. of the nitrogen, 35 per cent. of the ash and 91 per cent. of the iron. The substitution of citrate of iron and ammonia for the tincture of citro-chloride of iron, prevents these losses almost entirely, besides furnishing a brighter and more attractive preparation. The loss in the components mentioned is due to the precipitation produced by the tincture, which is minimized or prevented when the citrate of iron and ammonia is used. Summarizing the results, the author says that sixty-nine samples examined were below N. F. strength in nitrogen, twenty-nine were misbranded, and all but one of the misbranded samples were likewise low in nitrogen. Only twenty-two out of the ninety-two satisfy the calculated N. F. requirement of 7 milligrams of nitrogen per fluidrachm. The responsibility for these deficiencies rests partly on the formula itself, partly upon the quality, very largely upon the quantity of

the meat extract used in their preparation.—Amer. Journ. Pharm., Aug., 1908, 356–361.

Ferrated Cinchona Wine—A Patented Process of Preparation.—A patent has been granted in Germany to O. Schmatolla and H. Stein for the preparation of ferrated cinchona wine by the following process: Wine macerated with cinchona bark or cinchona extract is treated with metallic iron, in the presence of precipitated ferric hydroxide. The hydrogen developed by the organic acid of the wine acts as a reducing agent on the ferric hydroxide and renders it more soluble, even when the wine contains but a trace of free acid. At the same time, the whole of the tannin present both in the wine and the bark is precipitated and may be filtered out. This allows the use of bark which contains a large amount of tannin. It is claimed that the aroma of the wine is unaffected.—Pharm. Journ., Feb. 6, 1909, 150; from Chem. Tech. Report., 1908, *32*, 669.

MISCELLANEOUS PREPARATIONS.

Dietetic Preparations—Nutritive Value of Certain Commercial Products.—Ricciardo Sanfelici has analyzed plasmon, sanatogen, nutrose, somatose, and tropon, and is of opinion that substances prepared from casein are preferable to those prepared from meat, owing to their greater content of phosphoproteins; moreover, the albuminoids associated with casein are readily and completely converted into peptones, and are, therefore, easily absorbed. Plasmon is the most easily digested and cheapest of these preparations.—Pharm. Journ., Feb. 27, 1909, 272; from Stag. Agrar. Ital., *41* (1908), 283.

"*Safety Benzin*" is the name of a detergent described at some length, with the formula for its preparation, by Otto Raubenheimer, in the "Proceedings" of this Association, 1908, 1038–1041.

Ginger Ale—Formula.—M. R. Shotwell recommends the following formula for preparing a "splendid" ginger ale:

Soluble ess. ginger	4 drachms.
Soluble ess. lemon	2 drachms.
Fruit acid	2 drachms.
Syrup	10 ounces.
Caramel, q. s.	
Water, carbonated, q. s.	4 pints.

The soluble essence of ginger needed for the above formula may be made as follows:

F. E. ginger	4 ounces.
Powdered pumice-stone	1 ounce.
Water, q. s., to make	12 ounces.

Mix and shake well. Let stand a few hours and filter.

The soluble essence of lemon is prepared after this formula:

Ess. lemon	2 ounces.
Water	3 ounces.

Filter through magnesium carbonate.—Bull. Pharm., July, 1908, 295.

Glycerin-Honey Gelatin—Formula.—Ernst Richter gives the following formula, in use in the municipal hospital of Frankfort a. M., where it is used as a substitute for "kaloderma:" 150 Gm. of gelatin are softened in 1800 Gm. of distilled water for two hours, 6000 Gm. of glycerin are added, and the mixture is heated on a steam-bath until the gelatin is dissolved. A solution of 500 Gm. of honey in 1000 Gm. of warm water is then added, the two solutions are mixed, strained, and when half cooled perfumed by admixture with 100 Gm. of extract of lily of the valley. It is then poured into chilled tubes (collapsible), which are labeled with the direction that the "honey-gelatin" is to be applied only on the *wetted* skin.—Apoth. Ztg., xxiv (1909), No. 36, 327.

Ink—A Satisfactory Formula.—After discussing the question of good and bad writing inks, Wilbur L. Scoville suggests the following formula which, while not an ideal one, can be depended upon for permanency, can be used in a fountain-pen, and is at least equal to the average: Tannic acid, 3 ounces av.; gallic acid, 1 ounce av.: ferrous sulphate, 2 ounces av.; solution of ferric chloride, U. S. P., 1 fluidounce; indigotin, 1½ ounces av.: acacia, 60 grains: phenol 60 grains; water, 1 gallon. The tannic and gallic acids and the indigotin are dissolved in 6 pints of warm water, and the iron salts, acacia and phenol in 2 pints of water, the two solutions are mixed, frequently shaken during several days, and allowed to stand at least two weeks before filtering; but since this ink will deposit some on standing—which is one of its defects—it is well to filter it or decant as wanted. The ink develops its full color in about a week when the paper is exposed to the air. That is to say, it is much blacker at the end of a week than at first writing. If a copying ink is desired, about two ounces of sugar should be added to the above proportions of ingredients.—Pacific Pharm., Aug., 1908, 153–154.

C. New Remedies

and Trade-named Preparations.

Abanon is the name given to a mild aperient recommended particularly in nervous affections, which according to Dr. F. Zernik is the magnesium salt (containing 12 per cent. of MgO) of a complex phospho-tartaric acid. It is a white, tasteless powder and sparingly soluble in water.—Pharm. Zentralh., l, (1909), No. 6, 109.

Albulaktin is the name given to purified lactalbumen, which has been

converted into a readily soluble form. It may be regarded as being a neutral albumen-salt and, as supplied, is a white substance which, after preliminary soaking, forms a clear solution with water.—Pharm. Zentralh., l, (1909), No. 14, 285.

Alikolin is the name given to a specialty in form of tablets containing freshly prepared extracts of kola, extract of coca and glycerophosphates, as active constituents.—Pharm. Zentralh., xlix (1908), No. 51, 1040.

Allosan, is the name given to the allophanic acid ester of santalol. It contains 72 per cent. of santalol, over which it has the advantage of being tasteless and non-irritant, with equal medicinal efficiency in the same doses.—Pharm. Ztg., lii (1908), No. 59, 582.

Almatein is a condensation product obtained from hæmatoxylin and formaldehyde, which is supplied in form of a red powder, insoluble in cold water, readily soluble in hot water, alcohol and glycerin. Decomposed at 110°–120° C. Insoluble also in chloroform and in ether. It is recommended in the diarrhœa of children and in dysentery—the adult dose being 4–6 (Gm?). Externally it is used as dusting powder and as ointment (20 per cent.) with petrolatum.—Pharm. Ztg., liii (1908), No. 74, 724; from. Journ. de Phar. et Chim., 1908, No. 16.

Amolin is the name of an American specialty exploited as an antiseptic and deodorant, which is said to consist of boric acid with 1 per cent. of thymol.—Pharm. Ztg., liii (1908), No. 88, 868.

Amylodiastase is the name given to a French specialty, in form of syrup, containing the natural diastases of barley sprouts and their assimilable phosphates. Recommended in stomach and nervous affections, rachitis, etc.—Pharm. Zentralh., xlix (1908), No. 51, 1040.

Anusol Suppositories, a specialty for hemorrhoids introduced over a decade ago (see Proceedings 1898, 725), have been subjected to chemical investigation by Suyver, who finds that the compound bismuth-iodo-resorcin sulphonate—the so-called "anusol"—is not present in the suppositories supplied. They do not contain even a trace of iodine, and only a small quantity of resorcin, which is, moreover, in a free state, and the author therefore recommends the extemporaneous preparation of such suppositories by substituting "airol" (= bismuth oxyiodo-subgallate) for the so-called anusol directed in the published formula (loc. cit.), which would then read as follows: Airol, 6.0; resorcinol, 1.5; zinc oxide, 6.0; balsam of Peru, 1.5; oil of cacao, 19.0; simple ointment, 2.5. M. suppositor. No. xii.—Pharm. Ztg., liii (1908), No. 98, 971; from Pharm. Weekbl., 1908, Nos. 45 and 46.

Antikola, a Swiss specialty recommended in dipsomania, is according to Dr. Fuchs composed of tartaric acid and sodium bicarbonate, together with a vegetable powder containing a little starch and some sugar.—Pharm. Zentralh., l (1909), No. 6, 109.

Aperitol is the name given to a purgative specialty consisting of valeryl-acetyl-phenolphthalein, which is said to produce painless evacuations even in case of highly sensitive persons. It is given preferably in the form of fruit-bonbons, each containing 0.2 Gm. of medicament, the adult dose being two to four, that for children one or two of the bonbons.—Pharm. Ztg., liii (1908), No. 77, 759; from Med. Klinik, 1908, 1410.

Aperitol is described as a white crystalline powder, very soluble in aceton, chloroform or benzol, but soluble to the amount of 1 Gm. only in 40 Cc. of ether or 80 Cc. of alcohol, insoluble in petroleum ether and in water. It is both odorless and tasteless. While admittedly a mixture of *equal parts* of the valerianic acid ester and the acetic acid ester of phenolthalein, its formula is given as: $C_{20}H_{12}O_4(C_5H_9O)_2 + C_{20}H_{12}O_4(C_2H_3O)_2$. The normal dose is 0.4 Gm., which usually produces single copious evacuation in about 12 hours. In contrast to most other laxatives, aperitol does not lose its effectiveness by prolonged use, and is therefore particularly recommended in cases of chronic constipation.—Pharm. Ztg., liii (1908), No. 84, 827.

Arsacetin is the name given to p-acetyl-aminophenyl-arsenate of sodium, obtained by the acetylation of atoxyl. It is supplied in form of a white powder, containing 3–4 mol. of water of crystallization; soluble to the amount of 10 per cent. in cold water, 30 per cent. in hot water; absolutely free from arsenous or arsenic acids as such. Its solutions may be boiled without splitting off arsenic acid and even heated in the autoclave for an hour at 130° C. without undergoing decomposition. The remedy is indicated in parasitic affections requiring energetic treatment, such as trypanosomiasis, sleeping sickness, syphilis, etc., in doses 0.6 Gm., while smaller doses (0.1–0.5) are recommended in metabolism, anæmia, nervous diseases, etc.—Pharm. Ztg., liii (1908), No. 62, 608.

Arsan or "Arsenic-Glidin (see Iodglidin, Proceedings, 1908, 157) is found by Löb to contain from 3.8 to 4.4 per cent. of arsenic, which is easily but slowly split off in the system. It was possible to detect arsenic in the urine, eight days after the administration of a single dose. While absorption is prompt, a partial retention of the arsenic in the organism results.—Pharm. Ztg., liv (1909), No. 38, 377; from Mediz. Klinik, 1909, 625.

Arthigon is the name of an immunizing serum against gonorrhœa which is now manufactured according to a method developed by Bruck. Information concerning its manufacture is at present not available, nor have the pharmacological data so far secured led to a reliable estimate of its efficiency for the purpose for which it is intended. The new serum is therefore not yet offered on the market, being supplied only for pharmacological investigation.—Pharm. Ztg., liv (1909), No. 25, 251; from D. Med. Wschr., 1909, No. 11.

Asiphyl is the name given by its exploiters to p-amidophenylarsinate of mercury, and is claimed to combine the antiseptic properties of "atoxyl" and mercury.—Pharm. Ztg., liii (1908), No. 92, 911; from Boll. della Soc. Med. Chir. di Pavia.

Asquirrol is the name given to hydrargyrum dimethylicum, a water-soluble mercury preparation, which is claimed by its exploiters to contain 56 per cent. Hg. It is supplied in 5 per cent. solution and is recommended for the purposes of injection in cases of syphilis.—Pharm. Zentralh., xliv (1908), No. 42, 858.

Athènsa is the name given to a "tincture" of iron prepared without alcohol, and containing 0.2 per cent. of iron in form of an iron-saccharite free from alkali, together with aromatics and sufficient sugar for its preservation. It is supplied in flasks of 500 Gm. capacity, and being sterilized is claimed to keep well even in hot climates.—Pharm. Ztg., liv (1909), No. 21, 210.

Atoxyl is now exploited in combination with Blaud's pill mass, quinine, etc., in form of capsules, under the following designations:

Atoxyl-Blaud, containing 0.05 atoxyl and 0.15 Blaud's pill mass in each capsule, and

Chinatoxyl (*Quinine-atoxyl*) *Capsules* each composed of 0.01 atoxyl, 0.05 quinine hydrochloride, 0.0008 strychnine nitrate, and 0.3 Blaud's mass.—Pharm. Ztg, liv (1909), No. 16, 160; from D. Ärzte-Ztg.

Atoxyl-Iron Tablets (*Atoxyl-Eisen-Tabletten*) are supplied by the exploiters of atoxyl, each tablet containing 0.05 Gm. atoxyl, 0.05 Gm. iron lactate, and 0.15 Gm. milk sugar.—Pharm. Ztg., liii (1908), No. 55, 547.

Auxilier Tablets, a specialty exploited for the cure of diabetes, are stated to have the following composition: Extr. fol. myrtilli, 6.03: extr. cort. phaseoli, 5.17; extr. rhiz. tormentillæ, 3.45; extr. cort. syzygii-jambolani fluid., 6.05; fol. myrtilli, rhiz. tormentilla, aa 6.90; saccharin, ol. citri, albumin, aa 2.40. Divide into 24 tablets (each about 1.5 Gm.). Dose, 1–3 tablets thrice daily.—Pharm. Ztg., liii (1908), No. 92, 911.

Bromvalidol is the name given to tablets composed of sodium bromide, 1.0 Gm.; calcined magnesia, 0.1 Gm.; validol (see Proceedings 1898, 975), 5 drops. This combination is recommended particularly in cases of nervous prostration and in hysterical conditions occurring in the beginning of the climacterium.—Therap. Monatsh., 1908, No. 11; Pharm Ztg., liii (1908), No. 91, 902.

Bulgarine is a French specialty consisting of the pure cultures of Bulgarian milk ferment produced in a vegetable medium. It is supplied both in form of tablets and liquid, and is recommended in stomach and intestinal ailments.—Pharm. Centralh., xlix (1908), No. 51, 1040.

Callaquol is the name given to an agreeably aromatic emulsion of oxy-

tricarballylic acid ester, oil of thyme and a solution of white soap, which, inciting a hyperaemia of the skin, is employed to accelerate the effect of hydropathic treatments. The preparation is used in form of fomentations prepared by diluting 1 part, measured after thorough shaking, with 4 parts of cold water, saturating a linen cloth with the mixture, and applying the cloth to the affected part. It is recommended particularly in cases of inflammatory affections of the thoracic cavity and of the abdomen.—Pharm. Ztg., liii (1908), No. 66, 646; from Therap. Monatsh., 1908, No. 8.

Camphosan is the name of a specialty consisting of a solution of 15 p. of neutral camphoric acid methyl ester in 85 p. of pure santalol. It is a clear, oily fluid of sp. gr. 0.991 at 18.5° C., opt. rotation $[a]_D = -8°$, having a faint aromatic odor, reminding of camphor and santal oil, a mildly bitter taste, is insoluble in water, but readily soluble in organic solvents, such as alcohol, ether, chloroform, etc. Camphosan is recommended as a prophylactic in catheter operations, particularly in prostatitis, and in inflammations and catarrhs of the urethra, the bladder and the renal cavity, as also in gonorrhœa. It is supplied in form of elastic gelatin capsules, each containing 0.3 Gm. of camphosan, the dose being two capsules 3 to 5 times daily. The neutral

Camphoric Acid Methyl-Ester, $C_{12}H_{20}O_4$, is a water-clear colorless oil, having a faint aromatic odor and cooling bitter taste; insoluble in water; b. p. 258°–260° C.; sp. gr. 1.075; opt. rotation, $[a]_D = +53° 41'$. It is obtained by a patented process by methylating dextro-camphoric acid with methyl disulphate in alkaline solution.—Pharm. Ztg., liii (1908), No. 85, 841.

"*Carbolic Acid Tablets*," so-called, are tablets containing phenol in form of a neutral oxalic acid ester, each tablet containing 1 Gm. of *diphenyloxalicester*, to which a red color is imparted for the purpose of distinction. These tablets in form of ½–1 per cent. solutions are claimed to have the same disinfectant value as 3–4 per cent. phenol solutions; they are stable, non-hygroscopic, less poisonous, only faintly odorous, and free from the caustic action of ordinary phenol. When used for the disinfection of metallic objects, however, the addition of a little soda is necessary to neutralize the oxalic acid.—Pharm. Ztg., liii (1908), No. 68, 663.

Carbonic Acid Cataplasms are conveniently applied by the aid of material specially exploited for this purpose. It consists of a "creme" composed of carbonates combined with suitable distributing material and some menthol, on the one hand, and a pad or disc of woven fabric, saturated with tartaric acid, on the other. The "creme" is spread upon the surface to be treated, the pad, after moistening with a little water, is then applied, and the whole is covered securely with some impervious material, held in place by a light bandage.—Pharm. Ztg., liii (1908), No. 56, 553; from D. Aertze-Ztg., 1908, No. 11.

Cardiotonin is the name given to a specialty containing the active constituents of *Convallaria majalis* in combination with caffeine-sodium benzoate. It is recommended by the exploiters as a powerful diuretic, indicated particularly in cardiac affections.—Pharm. Ztg., liii (1908), No. 59, 583.

Cariesan is the name given to a preparation composed of alkali-sulphocyanides and diastase, supplied in form of tablets, and recommended for the prevention of caries in teeth. Its use is based upon the observation that alkali-sulphocyanides are natural constituents of the salvia, and that its bactericidal action has the effect of preserving the teeth. The remedy is commended in doses of one tablet morning and noon and two tablets at night.—Pharm. Ztg., liv (1909), No. 23, 230.

Caropan is the name given to a nutrient preparation composed of equal parts of "Somogen" (which see) and extract of malt.—Pharm. Ztg., liii (1908), No. 75, 739; from Therap. Rdsch., 1908, No. 38.

Cetosan is the name given to a new ointment base composed mainly of petrolatum (vaselin), which by a patented process is combined with certain of the high molecular alcohols obtained from spermaceti, or from Chinese wax, and from beeswax, and is then rendered capable of taking up water to the amount of 30 per cent. or more. The new base is supplied both in the hydrous and anhydrous form.—Pharm. Zentralh, xlix (1908), No. 28, 537.

Chinatoxyl Capsules, supplied by the manufacturers of atoxyl (which see), contains in each dose: 0.01 Gm. atoxyl; 0.05 Gm. quinine hydrochloride; 0.0008 Gm. strychnine; and 0.3 Gm. Blaud's pill mass.—Pharm. Ztg., liii (1908), No. 55, 547.

Chocosana is the name given to a palatable cod-liver oil preparation supplied in the form of brown somewhat glaced sticks, of pencil thickness, which are claimed to consist of cod-liver oil combined with a chocolate mass, and containing also lecithin-phosphoric acid and calcium phosphate. —Pharm. Ztg., liii (1908), No. 60, 591.

Citract is the name given to a staple preparation of lemon, representing the pure acidity of the fruit, together with its aroma, and consequently distinctly different from the lemon juice as ordinarily obtained, which is devoid of the aroma. It is supplied in a concentration of five times the strength of ordinary lemon juice, furnishing on dilution a perfectly stable substitute for the latter with the further advantage of agreeable flavor.—Pharm. Ztg., liv (1909), No. 35, 346.

"*Coc*" is a nutrient specialty, consisting of dried milk, deprived of fat, to which a salt (or salts) of glycerophosphoric acid is added. It contains 31.4 per cent. albumen, 41.7 per cent. sugar and 10.7 per cent. of mineral substances.—Pharm. Ztg., liv (1909), No. 21, 210.

Cocainolcreme, a Berlin specialty, is an ointment containing para-amidobenzoic acid-ethyl ester, β-naphtholdisulphonate of aluminum, zinc acetate, and thymol.—Pharm. Ztg., liv (1909), No. 48, 472.

Coryloform is the name given to a new anæsthetic exploited by a Paris firm, which is composed of ethyl chloride, ethyl bromide and methyl chloride.—Pharm. Ztg., liii, (1908), No. 83, 818; from L'Union Pharm., 1908, No. 9.

Coryzol is a specialty in form of an emulsion containing formaldehyde and oil of eucalptus as active ingredients. It is claimed to be quite efficacious in acute coryza, being inhaled from a handkerchief upon which from 15 to 20 drops of the emulsion have been distributed.—Pharm. Ztg., liv (1909), No. 3, 24; from Münch. Med. Wschr., 1908, No. 52.

Damiacatin is the name given to pills, recommended by their exploiters in sexual neurasthenia (functional impotence). They are said to contain in each pill: 0.05 each, of extract damiana, extract murai-puama, and ovo-lecithin; 0.002 yohimbin; together with powdered rhubarb and licorice root.—Pharm. Ztg., liv (1909), No. 21, 210.

Dealin is the name given to an antiseptic remedy for wounds, supplied in form of an odorless white-gray powder, which is said to be composed of dry fatty substances combined with a high percentage of oxygen. It is also supplied in form of ointments and combined with fats in a form suitable for application to the hoofs of animals in veterinary practice.—Pharm. Ztg., liii (1908), No. 99, 983; from Berl. tierarztl. Wschr., 1908, No. 49.

Dealin has been examined by Zernik, who finds it to have the following composition: Sodium perborate, 20 p.; boric acid, 10 p.; zinc oxide, 10 p.; talc, with a little starch and magnesium carbonate, 60 p.—Pharm. Ztg., liv (1909), No. 46, 453.

Dericin Oil is the name of an oxidation-product of ricinus oil, which is exploited as a basis for ointments, liniments and soaps. According to Aufrecht it is obtained, under a patented process, by passing a current of oxygen or air into castor oil heated to 300° C., and distilling until it has lost from 10 to 12 per cent. of its weight. This treatment causes a polymerization of the constituents of the oil, a portion of the ricinoleic glycerides being converted into glycerides of undecylenic acid or polyundecylenic acids. Dericin oil is remarkable for its extraordinary ability to take up water. It is distinguished from ricinus oil by its insolubility in absolute and in 90 per cent. alcohol, but it is soluble and miscible in all proportions in ether, chloroform, benzene, petroleum-ether and petroleum. Shaken with water it readily forms a white emulsion, from which, however, oily drops separate on prolonged standing. Over wool fat it has the advantage of producing ointments of a less sticky consistence.—Pharm. Ztg., liv (1909), No. 12, 118.

Desalgin, also called "Chloroformum colloidale," is a specialty stated to contain 25 per cent. of chloroform combined with albumen, which is particularly recommended as a remedy in gall stone, intestinal—and abdominal colic; also in asthma and catarrhal affections of the respiratory organs. The dose is 0.25 Gm., increased to 1 Gm. in severe pain, administered dry, in cachets, or in water, tea, coffee, etc.—Pharm. Ztg., liii (1908), No. 69, 676.

Dialon is the trade name recently given to a diachylon ground powder. —Pharm. Ztg., liv (1909), No. 3, 24.

Dialysates of Thyme and of Pinguicala are specialties exploited by a Swiss manufacturing firm. The latter is prepared from two alpine plants, *Pinguicula alpina* and *Pinguicula vulgaris*—the so-called "butterwort"—and is claimed to contain a proteolytic ferment upon which its medicinal value depends.* The dialysate is given to children up to five years old in doses of a single drop, morning and night, in water, increasing the dose to 2 or 3 drops; older children are given 2 drops, increased to 4 drops, —Pharm. Ztg., liii (1908), No. 56, 553; from Münch, Med. Wschr., 1908. No. 27.

Diaphanit is the name given to a a preparation of magnetic iron ore, containing cacao and salep—the latter to hold the heavy ore in suspension —which is prepared for administration by simply stirring the powder with hot water. The preparation is introduced to facilitate the use of magnetic iron ore in examinations of the duodenum with the Röntgen rays: this substance having recently been proposed to replace the bismuth compounds, heretofore used for the purpose, which have been objected to on account of their toxicity, whereas magnetic iron ore is known to be perfectly innocuous.—Pharm. Ztg., liv (1909), No. 45, 443; from D. Med. Wschr., 1909, No. 20.

Diazellose is the name by which a soluble cellulose (hemicellulose) is supplied by its exploiters. It forms a yellowish white powder, having an agreeable, malt-like odor, and is comparatively easily soluble in hot water. It is claimed to be composed mainly of sugar-forming carbohydrates (glactan), and is recommended as a nutrient for diabetics, given in tablespoonful doses (3 to 4 per day) in milk, coffee, tea, bouillon or soup.—Apoth. Ztg., xxiv (1909), No. 36, 327; from D. Med. Wschr., 1908, No. 47.

Digipuratum is one of the latest German novelties in digitalis preparations. It is physiologically standardized so as to represent the active constituents of digitalis leaves of normal good quality, weight for weight,

* Professor Russow in 1881 (see Proceedings, 1882, 162), described the leaves of the "butterwort" (*Pinguicula vulgaris*, L.), as containing copious quantities of albuminous crystalloids, to which he attributed the well-known insectiverous properties of the plant. Rep.

in a medium of sugar of milk. Both digitoxin and digitalin can be demonstrated in this preparation by the method of Keller: The dose, conforming to that of good digitalis leaves, is 0.1 Gm., and it is supplied both in form of powder, and in form of tablets of this strength.—Pharm. Ztg., liii (1908), No. 71, 696.

Diplosal is obtained by the moderate action of dehydrating agents on salicylic acid or salicylates and has the composition: $OH.C_6H_4.CO.OC_6H_4.COOH$. It forms white, odorless needles, melting at 147° C., having a faintly bitterish taste; is nearly insoluble in water and dilute acids, difficultly soluble in cold benzene, more soluble in ether and alcohol. In caustic and carbonated alkalies it is soluble, forming salts, but the solutions produced are gradually decomposed at room temperature, the splitting-up being more rapid and complete if heated. The filtered aqueous solution gives no color reaction with ferric chloride, but if diplosal is dissolved in normal potassa solution, heated, and mixed with an equal volume of normal sulphuric acid, the intense violet color characteristic of salicylates manifests itself. Diplosal is indicated in all cases in which salicylic acid or its salts and substitutes are used, the average single adult dose being 1 Gm., the daily dose, up to 5 or 6 Gm. It is supplied both in powder and tablet form.—Pharm. Ztg., liii (1908), No. 77, 759.

Di-Propaesin is the name given to a condensation compound resulting from the union of 2 mol. of *propaesin* with CO. It forms a light, odorless and tasteless white powder, of neutral reaction, insoluble in water, readily soluble in alcohol, difficultly soluble in other solvents, and, unlike propaesin (which see), it has no direct local anesthetic properties. In cold physiologic-alkaline solution, however, *di-propaesin* splits up into propaesin, which possesses powerful local anesthetic action. Di-propaesin, therefore, does not become effective until it reaches the intestinal tract, where, in contact with the alkaline fluids, it liberates propaesin, which promptly exerts its anesthetic action. Di-propaesin, as well as propaesin, being free from irritant or toxic action, may be given in doses of 0.5 to 2.0 Gm. for the relief of spasmodic pains in the intestinal tract.—Pharm. Ztg., liii (1908), No. 83, 818.

Gallisol is the name given to a remedy for gallstone, said to be composed of potassium sulphide, castor oil, birch tar, alcohol and peppermint oil. It is to be given in doses of 25 to 30 drops in a tablespoonful of water, thrice daily.—Pharm. Ztg., liii (1908), No. 95, 942; from D. Med. Wschr., 1908, No. 45.

Gallisol, which, according to its exploiter, is composed of potassium sulphide, castor oil, birch tar, peppermint oil and alcohol, has been examined by Zernik, who confirms the composition in essentials, but found that the sulphide, probably originally present, had changed to sulphate and thiosulphate.—Pharm. Ztg., liv (1909), No. 46, 453.

Galmanin, a dusting powder exploited in Poland, has been examined by Zernik, who finds it to contain: zinc oxide, magnesium carbonate, talc, starch and traces of lead—the latter probably an impurity derived from the zinc oxide.—Pharm. Ztg., liv (1909), No. 46, 453.

Gastrosan is the name given to bismuth bisalicylate, which is supplied by its exploiters in the form of tablets. The compound contains from 48–50 per cent. of bismuthyl oxide and 50–52 per cent. salicylic acid. By hot water, as also by fermentation, one-half of the salicylic acid is readily split off and thus becomes quickly effective.—Pharm. Ztg., liii (1908), No. 103–104, 1024.

Gingament Tabloids, recommended as a stomachic and antacid remedy, contain according to F. Zernik the bicarbonates of sodium and ammonium, oleo-resin of ginger, oil of peppermint, and saccharin.—Pharm. Zentralh., l (1909), No. 6, 109; from Südd. Apoth.-Ztg., 1909, 58.

Gloin is the name given to an ancient South Russian remedy, the so-called sareptan balsam, which is recommended as a stimulant and tonic for the digestive organs. It is said to contain the active constituents of the following drugs: Cinnamon, cloves, cardamoms, gentian, calamus, angelica (root), centaury, ginger and peppermint.—Pharm. Ztg., liv (1909), No. 21, 211; from D. Ärzte Ztg., 1909, No. 4.

Gynoval is the name given to the isoborneol ester of isovalerianic acid. It is a colorless, neutral liquid, having a mild, oily taste and an odor which is essentially more agreeable than that of the older valerian preparations. —Pharm. Ztg., liv (1909), 45, 443; from D. med. Wschr., 1909, No. 21.

Haemoglobin-Gral-Nutrient is the name given to a chocolate preparation of honey-like consistence, containing 10 per cent. of haemoglobin. According to Gerlach, the latter is present in form of oxyhaemoglobin.

Haemoglobin-Gral-Food, a solid preparation exploited by the same manufacturers, is claimed to contain 12½ per cent. of haemoglobin.—Pharm. Ztg., liv (1909), Nos. 21 and 23, 211, 230; from Ztschr. f. oeffentl. Chem., 1909, No. 4.

Helkomen is the name given to a new iodoform substitute, consisting of basic dibrom. β-oxynaphthol bismuth.—Pharm. Ztg., liii (1908), No. 66, 646.

Indoform, claimed by its exploiters to be a definite chemical compound, has been examined by Frerichs, who finds it to be simply a mixture of salicylic acid and acetyl salicylic acid, containing traces of formaldehyde. —Pharm. Ztg., liv (1909), No. 37, 304.

Iodeigon, also called iodeigonnatrium, is a specialty exploited as a substitute for alkali iodides, and is claimed to contain 15 per cent. of iodine. Frerichs, who has examined this preparation, regards it as a simple mixture of sodium iodide and soluble albuminoids, containing fluorine as a preservative.—Pharm. Ztg., liv (1909), No. 37, 364.

Iodival, is *a*-monoiodisovalerylurea: $(CH_3)_2CH.CHI.CO.NH.CO.NH_2$. The compound contains 47 per cent. of iodine, melts at 180° C., is almost insoluble in cold water, more soluble in hot water, and readily soluble in alcohol and in ether. It is indicated in all cases in which potassium iodide is prescribed, the adult dose being 0.3 Gm. three times daily.—Apoth. Ztg., xxiii (1908), No. 83, 763.

Iodival is described as forming white, feebly bitter, needle-shaped crystals.—Pharm. Ztg., liii (1908), No. 81, 798.

Dostrah Preparations, consisting of a powder, an ointment and a tincture, are stated to have the following compositions respectively:

Dostrah Blood Purifier, a powder containing 10.0 magnesium oxide, 20.0 magnesium peroxide, 29.75 each, sugar and milk sugar, 5.0 each, starch and citric acid, 0.4 pepsin, and 0.1 powdered licorice root.

Dostrah Ointment is composed of: Magnesium oxide, 20.0; lanolin, 40.0; vaseline, 40.0: white wax, 10.0; boric acid, 10.0. Recommended for herpes, eruptions, boils, wounds, etc.

Dostrah Tincture, recommended for rheumatism, is said to be composed of camphor, 30.0; turpentine (oil? Rep.), 30; menthol, 50.0; tincture of myrrh, 10.0; terpineol, 30.0; alcohol, 50.0.—Pharm. Zentralh., l (1909), No. 7, 130.

Ernutin is the name given to an ergot specialty, containing principally "ergotoxin" as active ingredient. It is a clear, transparent fluid, which may be injected subcutaneously or intramuscularly in doses of 0.3 to 0.6 Cc., without irritant effect. Internally it may be given in doses of 1.8 to 3.5 Cc., and having an agreeable taste it is readily taken. It is also recommended in Basedow's sickness, hysteria, diabetes insipidus, but is not recommended in cerebral or pulmonary hemorrhages.—Pharm. Ztg., liii (1908), No. 74, 724.

Eugatol is the name given to a mixture of the sodium salts of p-amidodiphenylaminemonosulphonic acid and o-amidophenolsulphonic acid, which is exploited as a non-poisonous substitute for p-phenyldiamine. It is used in combination with hydrogen dioxide as a hair dye.—Pharm. Ztg., liii (1908), No. 98, 972: from Südd. Apoth.-Ztg., 1908, No. 89.

Eulatin, is the name given by its exploiters to "amidobrombenzoate of dimethylphenylpyrazolon," and is recommended as a whooping-cough remedy.—Pharm. Ztg., liii (1908), No. 95, 942.

Eulaxans is the name given to a laxative specialty composed of 1 mol. phenolphthalein and 2 mol. sodium hydroxide. Its activity is claimed to depend on the liberation of the phenolphthalein by the acid juices of the stomach, thus reaching the intestine in form of solution and attaining its full activity in the alkaline intestinal fluids. Eulaxans is supplied in bulk and in form of sugar-coated tablets.—Pharm. Post, 1908, No. 72.

Euphyllin is the name of a new diuretic obtained by combining ethylendiamine with theocin (theophyllin), whereby the latter becomes water-soluble and thus available for subcutaneous administration. 1 Gm. of the new compound corresponds to 0.78 Gm. of theocin. It is recommended in the form of clysters dissolved in mucilage of oatmeal or of salep, in form of subcutaneous solutions, and in form of suppositories. When administered per os, its solutions are more acceptable if flavored with tincture of orange-peel.—Pharm. Ztg., liii (1908), No. 66, 646; from Therap. Monatsh., 1908, No. 8.

Ferralbol is the name given to an albumen preparation, claimed to be a compound of egg albumen containing, besides 3 per cent. of iron, 1 per cent. of lecithin. It appears to be supplied in powder and in 0.5 Gm. tablets.—Münch. Med. Wschr., 1909, No. 19; Pharm. Ztg., liv (1909), No. 40, 397.

Ferramat is a specialty in pill form, each pill containing in addition to 0.12 Gm. of iron certain bitter and aromatic substances.—Pharm. Ztg., liv (1909), No. 35, 346.

Iodomenin is the name of a specialty which is described by its exploiter as being a compound of iodine, bismuth and albumen. It is supplied in form of tablets, said to have an iodine content corresponding to 0.05 Gm. potassium iodide in each. Examined by Zernik, they were found to contain halogens corresponding to 0.07 Gm. KI in each tablet, but a small portion of this is attributable to chlorine present. About 2 per cent. of bismuth was also determined.—Pharm. Ztg., liii (1908), No. 100, 990.

Iodpeptid, a new iodine preparation, of Italian origin, which is claimed to be particularly suitable for subcutaneous medication, is obtained by peptonizing 10 Gm. of albumen, dissolving the product in 10 Gm. of water and acting upon the solution with iodine *in statu nascendi*. The preparation is supplied in three strengths, containing respectively 1.75 per cent., 2.45 per cent., and 3.48 per cent of iodine, in sterilized ampuls, each containing 5 Cc. It is strongly coagulated by solutions of the heavy metals (Fe_2Cl_3,HgCl,$CuSO_4$), and with dilute solution of cupric sulphate and excess of potassium hydroxide develops the characteristic red-violet reaction of blood.—Pharm. Ztg., liii (1908), No. 99, 983; from Giornale di Farm., di Chim. e di Sc. x, No. 41.

Kharsine, according to Dr. F. Zernik, consists of the sodium salts of para-amido-metatolyl-arsenic acid.—Südd. Apoth. Ztg., 1909, 66.

Lactalexin is the name given to a specialty containing spermin, thymin, thyreoidin, nucleinic acid and milk sugar, which, it is claimed, has been used with advantage in the treatment of rachitis, scrofula and neurasthenia. —Pharm. Ztg., liii (1908), No. 99, 983.

Lactoferrol is the name given to a Russian specialty consisting of milk, containing ten times the normal iron constant (0.02 per cent., instead of

0.002 per cent.). The preparation is supplied in sterilized containers.—Pharm. Ztg., liii (1908), No. 91, 902; from Phamaz. Jour., 1908, 864.

Lactoform is a formalin-albumen preparation produced from milk concentrated in a vacuum, which is recommended to be used as a massage in rheumatic affections.—Pharm. Ztg., liv (1909), No. 10, 99; from Wien. klin. Rdsch., 1900, No. 4.

Lactoiod, a specialty recommended as a substitute for alkali iodides, is a a combination of lactalbumin with 5 per cent. of iodine, which is claimed to facilitate the rapid absorption of iodine in the presence of the gastric and intestinal juices.—Pharm. Ztg., liv (1909), No. 30, 300; from Therap. d. Gegenw. 1909, No. 4.

Laxin-Confect is a specialty in form of tablets, each containing 0.12 Gm. phenolphthalein combined with a confection of apples and having a very agreeable taste, so that it is readily taken by children. It is claimed to be mildly aperient.—Pharm. Ztg., liii (1908), No. 88, 868; from Therap. Monatsh., 1908, No. 19.

Lentocalin is the name given to a preparation obtained from the fresh crystalline lens of animals, which is intended for the treatment of cataract in elderly persons.—Pharm. Ztg., liv (1909), No. 21, 211.

Leukofermantin, an animal antifermentserum which was originally obtained by immunizing horses with purified and concentrated solutions of proteolytic leucocyte-ferment, is now obtained according to Dr. Edward Mueller by immunizing the animals with pancreatrypsin. The serum, which is rich in antiferment, is concentrated in a vacuum and its titer adjusted to normal human blood, some phenol being added as a preservative. The serum is recommended for the treatment of abscesses.—Pharm. Zentralh., l (1909), No. 7, 131; from Zentrabl. f. Chirurgie, 1909, No. 3.

Linoval is the name given to an ointment base which is said to be composed of 93 per cent. vaseline, 5 per cent. of a fatty acid obtained from linseed oil, 1 per cent. of ammonia and 1 per cent. of oil of lavender. It is capable of taking up 15 per cent. of water and is claimed to possess unlimited stability so long as it is not heated to its melting-point (= 31° C). Medicaments must therefore be incorporated by trituration at the ordinary temperature.—Pharm. Ztg., liii (1908), No. 63, 620; from Med. Klin., 1908, 1116.

Macrobiose, a nutrient and tonic specialty, is described by Dr. J. Nerking as a light brown powder, interspersed with minute yellowish-white lumps, and having an agreeable cacao odor and a somewhat insipid, faintly saline taste. Analysis determined 13.16 per cent. of water, 6.37 per cent. of ash (of which 21 per cent. was soluble and 79 per cent. insoluble in water), 9.51 per cent. of fat (including 1.42 per cent. lecithin), 43.43 per cent. of albumen, and 27.52 per cent. of carbohydrates.—Pharm. Zentralh., l (1909), No. 6, 109; from Med. Klin. 1909, 135.

Medinal Solubile is the name given to the mono-sodium salt of diethyl-barbituric acid, the latter being more familiarly known by its trade name as "Veronal." While veronal has the reputation of being an excellent hypnotic, it suffers from the disadvantage of difficult solubility, which not alone retards its action but is said also to give rise to certain unpleasant after-effects. These disadvantages are claimed to be overcome in the sodium compound now supplied under the name of "medinal solubile," which is soluble in water in the proportion of 1 : 5, and therefore available both for rectal and subcutaneous injection, while the untoward effects, due to tardiness in action, are eliminated. The new remedy is supplied both in powder and in 0.5 Gm. tablets.—Pharm. Ztg., liii (1908), No. 55, 547.

Medol is the name given to a creolin liniment intended in veterinary practice for the treatment of wounds and skin diseases.—Pharm. Ztg., liii (1908), No. 64, 629.

Meligrin, a new migrainine substitute, is said to be a condensation product of dimethyloxychinicine and methylphenylacetamide.—Apoth. Ztg., xxiii (1908), No. 83, 763.

Mercochinol is the name given to mercuric oxychinolsulphonate, which is recommended in lues in form of injections and embrocations, and is also administered per os.—Pharm. Zentralh., l (1909), No. 6, 109.

Mercuric Atoxylate is, according to Uhlenhut and Manteufel, the p aminophenylarsinate of mercury, a compound in which the pharmacological activity of the atoxyl is substantially increased by the presence of the mercury.—Pharm. Ztg., liv (1909), No. 10, 99; from Med.-Klin., 1908, No. 43.

Mergandol is the name of an antisyphilitic specialty, used as an injection, which is claimed to contain in each Cc. 0.0035 Gm. Hg in form of a mercury-sodium-glycerate dissolved in glycerin. According to an analysis of Dr. F. Zernik, however, this preparation is a simple solution of 0.5 mercuric chloride and 0.1 sodium chloride in 100.0 parts by weight of hydrous glycerin.—Apoth.-Ztg., xxiv (1909), No. 11, 98.

Morbicid is the trade name given to a potash-rosin soap containing about 12 per cent. of formaldehyde. It is supplied in form of a brown, glutinous fluid having a pronounced odor of soap and of formaldehyde.

Morbicid G. is a modification, intended particularly for gynæcological purposes, containing a certain proportion of olein soap with about 13 per cent of formaldehyde. The disinfectant value of the two preparations appears to be about the same, with a possible amelioration of the irritant properties of the formaldehyde.—Pharm. Ztg., liii (1908), No. 60, 590; from "Disinfektion," i, No. 1.

Morphosan is the name given to "morphine methylbromide ($C_{17}H_{19}O_3NBrCH_3$)." This forms white needles (m. p. 265°–266° C.) is

sparingly soluble in cold water, readily in hot water, and is recommended as a substitute for morphine in the treatment of the morphine habit. The dose is 20 drops of a 5 per cent. solution per os, or 0.005–0.01 Gm., subcutaneously several times daily.—Pharm. Ztg., liii (1908), No. 63, 620.

Nesain is the name given to a protein-arsenic compound which is recommended as admitting larger doses of arsenic into the organism than is the case with atoxyl. It is administered subcutaneously in form of 10 per cent. solution.—Pharm. Ztg., liv (1909), No. 23, 230; from Ztschr. f. d. ärztl. Praxis, 1908, No. 19.

Neurosedat is the name given to a specialty representing in one teaspoonful 0.0145 Gm. each of extr. cannab. and extr. hyoscyam., 0.0075 Gm. codeine, and 0.285 Gm. each of bromides of potassium, sodium and ammonium.—Pharm. Ztg., liv (1909), No. 35, 346.

Neuroton is the name given to a specialty, described by its exploiters as being "spermo-neuclein salicylate." It is supplied in form of tablets and hypodermic solution, and is indicated in cases requiring elevation of the vital energy.—Pharm. Centralh., l (1909), No. 6, 109; from Therap. Rdschau, 1909, No. 5, 67.

Novolax is the name of purgative specialty, supplied in form of chocolate-coated tablets, each containing 0.12 Gm. of phenolpthalein with extract of tamarinds as a basis.—Pharm. Ztg., liii (1908), No. 99, 983.

Odylis is the name given to a terpin resorcinate, which is obtained by heating the calculated quantities of terpin and resorcinol in a porcelain dish to 100° C. It forms a yellowish, thick, oily liquid, of agreeable odor, soluble in alcohol, ether and fixed oils, and easily incorporated with ointment bases. Odylis is recommended as an antiseptic and is used both externally and internally, being for the latter purpose inclosed in gelatin capsules; externally it is said to promote cicatrization.—Apoth. Ztg., xxiv (1909), No. 36, 327; from Journ. d. Pharm. d'Anvers., 1909, 295.

Orudon is the name given to two preparations, the one a liquid ("Essenz"), the other a salt, which, notwithstanding identity of name, differ decidedly in their composition. The liquid is stated by its exploiters to have the following composition: "Ammonium jodatum salicyl. sol." (of sp. gr. 1.145), 50 per cent.; diethyldiamine, 5 per cent.; extract. aromaticum, 5 per cent.; alcohol, 40 per cent. Analyzed by Dr. Aufrecht, it was found to contain in 100 Cc.: Water, 50.30 Gm.; alcohol, 21.99; iodine, 10.46; salicylic acid, 7.55; piperazine, 4.90; ammonium, 0.49; extractive substances (by difference), 0.69; ash, 4.52. This preparation is recommended for the treatment of rheumatism and neuralgias. The second preparation (the salt), recommended for gout and metabolism, is stated by the manufacturer to have the following composition: Urea citric. basic.; diuretin, 10 per cent.; natr. magnes. lith. carb., saturated with citric acid, 55 per cent.; natr. sulfur., 15 per cent.; extract. amar.,

2 per cent. The analysis of Dr. Aufrecht reveals: Organic substances, 66.01 per cent. and mineral substances, 33.09 per cent., distributed as follows: Urea, 8.07 per cent.; diuretin, 4.96 per cent.; magnesia (MgO), 7.87 per cent.; lithia (Li_2O), 0.52 per cent.; soda (Na_2O), 8.82 per cent.; sulphuric acid (SO_3), 5.85 per cent.; carbon dioxide (CO_2), 19.93 per cent.; extractive and citric acid (as remainder), 52.98 per cent.—Pharm. Ztg., liii (1908), No. 97, 964; from "Das Rezept," 1908, No. 11.

Ostauxin is the name of a Hungarian specialty, recommended as a general tonic and roborant, which is apparently a calcium paraneucleinate, and is prepared as follows: 360 Gm. of casein and 60 Gm. of pepsin are suspended in 24 liters of water, 240 Gm. of hydrochloric acid, sp. gr. 1.12, are added, and the mixture set aside at 40° C. for 24 hours with frequent stirring. It is then filtered and the filtrate, heated to boiling, is neutralized with calcium carbonate, concentrated to ½ liter and allowed to cool. Milk of lime is now added to the cold liquid, in small portions at a time, to distinct alkaline reaction; the excess of lime is precipitated with carbon dioxide, filtered off, and the calcium paraneucleinate precipitated from the filtrate with alcohol, well washed with alcohol and dried in a vacuum at a low temperature. Yield 140 Gm. Ostauxin so prepared is stated to contain 17 per cent. Ca, 9 per cent. N and 2.5 per cent. P. An original sample, examined by Dr. F. Zernik, was found to consist of a fine, white powder having a faint saline taste. It was readily soluble in cold water, forming a faintly turbid, yellowish, barely alkaline reacting liquid, and depositing on standing a sediment consisting of a variety of mechanical impurities. Subjected to analysis it was found to lose 12.35 per cent. of its weight at 100 C., and to contain: Calcium, 5.88 per cent.; nitrogen, 9.75 per cent., and phosphorus, 1.75 per cent. The aqueous solution of calcium paraneucleinate, obtained as above described, serves for the preparation of a second specialty, *Parabismuth* (which see), exploited by the same manufacturer as a substitute for "Bismutose."—Apoth. Ztg., xxiv (1909), No. 10, 88.

Oxygar is the protected trade name for hydrogen peroxide intended for internal use, which is prepared by a patented process in Germany and is marketed in glass cylinders of about 8 Gm. capacity. It is a tasteless preparation and is recommended in affections of the stomach and intestines.—Pharm. Zentralh., l (1909), No. 14, 285.

Ozonal is the name given to the material supplied for the purpose of producing the oxygen-baths in Hallein and Berchtesgaden. It contains sodium peroxide and sodium bicarbonate, the mixture developing oxygen abundantly in contact with water) see also "Sedlozon.").—Pharm. Ztg., xlv (1909), No. 46, 453; from D. Ärzte-Ztg., 1909, No. 11.

Pantopon, is the name given to an opium preparation containing the total alkaloids of opium in saline combination with hydrochloric acid. It

contains about 90 per cent of total alkaloid, 1 Gm. corresponding to 5 Gm. opium = 0.5 Gm. morphine and 0.4 Gm. secondary alkaloids. The preparation may be used with advantage for subcutaneous injections, which are sterilizable without decomposition. The dose is about double that of morphine.—Pharm. Ztg., liv (1909), No. 3, 25; from Therap. Monatsh., 1909, No. 1.

Parabismuth is a specialty introduced by a Hungarian firm as a substitute for "bismutose. It is prepared from a calcium paraneucleinate, exploited by the same firm under the name of *ostauxin* (which see), as follows: One part of paraneucleinate is dissolved in 5 parts of saturated solution of sodium chloride, the solution filtered, and a filtered solution of bismuth nitrate in saturated solution of sodium chloride is added until precipitation ceases. The precipitate is collected and gradually washed with sodium chloride solution until the excess of bismuth nitrate is removed; then washed with water to remove the sodium chloride, and finally, with alcohol and ether. On drying at about 30° in a vacuum, parabismuth is thus obtained in form of a nearly white powder, which is insoluble in water, and is claimed to contain 50 per cent. of bismuth. Examined by Dr. F. Zernik, the preparation proved to be a yellowish powder, odorless, and having a faint saline taste; insoluble in water, but soluble in warm concentrated HCl, forming a brownish-yellow solution, rendered turbid by the presence of mechanical impurities. Analysis determined a content of 49.3 per cent. Bi_2O_3 (=44.20 per cent. Bi), with a total ash of 51.20 per cent., 5.76 per cent. nitrogen, and 0.67 per cent. phosphorus. At 100° C., it lost 5.2 per cent. of its weight.—Apoth. Ztg., xxiv (1909), No. 10, 88.

Phenostal is the name given to disinfectant tablets containing diphenyl oxalic ester as active constituent. This ester is quickly split into its constituents, 32 per cent. being oxalic acid and 68 per cent. phenol, and the solution so produced is claimed to possess five times greater disinfectant action than that of the same quantity of pure phenol. The tablets contain 1 Gm. of the medicament, and are colored pale violet, communicating a faint wine-red color to their solutions.—Pharm. Zentralh., xlix (1908), No. 39, 797.

Phenyldihydrochinazolinum Tannicum is exploited by a Berlin firm as a substitute for orexine tannate (see Proceedings, 1899, 754).—Pharm. Ztg., liii (1908), No. 99, 983.

Phosiron is the name given to a neutral iron salt of the complex so-called "phospho-tartaric acid," and contains 19 per cent. of iron and 6.5 per cent. of phosphorus. It is insoluble in water or diluted acids, but soluble in alkaline media, and therefore passes unchanged through the stomach, and does not become effective until it reaches the intestines.—Pharm. Ztg., liv (1909), No. 46, 453; from D. Ärzte-Ztg., 1909, No. 11.

Phosiron is a new name given to "Ferrosin" (see Proceedings, 1896,

474 and 485), which has since also been named "Phosidin."—Pharm. Zentralh., l (1909), No. 6, 109.

Phosrachit is the name given to phosphorated cod-liver oil which is rendered stable by certain additions (compare *Phosphorated oil* under "Olea."—Pharm. Ztg., liii (1908), No. 85, 841.

Plejapyrin is the name given to a new migrain remedy which is said to be obtained as a condensation product of equal molecules of benzamide and phenyldimethylpyrazolon. It forms a white, odorless powder, having a mildly bitter taste; soluble in 15 parts of water; melts near 75° C., and possesses unlimited stability.—Pharm. Ztg., liii (1908), No. 74, 724.

Plejapyrin-Para is the name given to a specialty which is said to be a definite compound of *p*-toluolsulfamide and 1, phenyl, 2, 3, dimethyl-pyrazolon in equal molecular proportions.—Pharm. Ztg., liv (1909), No. 33, 325.

Poslam is the name given to an ointment composed according to the examination of Puckner and Hilbert of: Zinc oxide, 12.01; sulphur, 6.67; starch, 22.00; tar oil, 15.18; menthol and salicylic acid in small quantities, and sufficient of a fat-base to make 100.0.—Journ. Amer. Med. Assoc., 1909, 1678.

Projodin is a new name given to "Lactojod" (which see) for reasons explained by the manufacturer as depending on certain patent regulations. —Pharm. Ztg., liv (1909), No. 33, 325.

Propaesin is the name by which the propylester of paramidobenzoic acid is exploited as a powerful local anesthetic. If forms white crystals, which are somewhat sensitive to light, have a faintly alkaline reaction, and are saponified into the original constituents when boiled for several hours with excess of soda solution under a reflux condenser. Propaesin is very sparingly soluble in water, but very readily in alcohol, benzene and other organic solvents, and soluble to the amount of 7 per cent. in fixed oils. While more pronounced in its anesthetic action than the local anesthetics commonly employed, it is entirely devoid of irritant or toxic action, and is regarded as being particularly efficient in the treatment of affections involving mucous membranes (see also Di-Propaesin).—Pharm. Ztg., liii (1908), No. 83, 818.

Protein-Milksalt-Cacao is a nutrient specialty which, according to an official analysis, has the following composition: Water, 6.89 per cent.; ash (milksalts), 7.61 per cent.; fat, 15.44 per cent.; theobromine, 1.65 per cent.; albumen, 37.23 per cent.; other organic extractive substances (soluble in alcohol), 8.49 per cent.; starch, 12.21 per cent.; sugar, in traces; crude fiber, 4.51 per cent.—Pharm. Ztg., liv (1909), No. 21. 211; from Therap. d. Gegenw., 1909, No. 3.

Pulmacol, is according to F. Zernik the name given to a substitute for "Sirolin" (see Proceedings, 1899, 489) containing some extract of thyme.

—Pharm. Zentralh., 1 (1909), No. 6, 109; from Südd. Apoth. Ztg., 1909, 50.

Pyrojodon is an Italian specialty which is said to be an iodine derivative of "pyramidon." According to the investigation of Cousin, however, it is simply a mixture of pyramidon and of its iodhydrate—all of its iodine content being directly precipitable with silver nitrate. It is supplied in form of solution containing 24.3 Gm. pyramidon iodhydrate and 7.4 Gm. pure pyramidon in 100 Cc.—Pharm. Ztg., liii (1908), No. 69, 676; from Jour. de Pharm. et Chim., 1908, No. 4.

Radiol Preparations are prepared from a radio-active substance obtained from the sinter of the Kreuznach Mineral Springs, which has been given the name "radiol." This is an insoluble white powder of which 125 Gm. are capable of discharging in the electroscope 100000 volts per hour. The preparations supplied comprise compresses, bandages, globules and ovules, suppositories, liniment, ointment and soap.—Pharm. Ztg., liv (1909), No. 34, 337.

Rad-Jo is the name of a specialty for which the following formula is given by the manufacturer: Fruct. carv. pulv., fruct. anisi pulv., rhiz. graminis, rad. valerian., herb. et fol. meliss., cort. salicis pentand., aa 1.0; fruct. jugland. immat., 10.0; pulp. tamarind., 6.0; sem. lini pulv., 15.0; extr. cascar. sagrad., 1.5; cort. frangulæ, 2.5; acid citric, 2.0; mel natur., 5.0; sacch. alb., 10.0; alcohol, 6 per cent.—Pharm. Ztg., liv (1909), No. 3, 25.

Rectosanol are suppositories for hæmorrhoids, containing eucaine, stovaine and adrenalin as active constituents.—Pharm. Ztg., liv (1909), No. 14, 139.

Regenerin (liquid), also designated as "ovo-lecithin-manganese-iron," is a clear, reddish-brown fluid, said to contain 0.3 per cent. of lecithin, 0.6 per cent. of iron and 0.1 per cent. of manganese, in an aromatic liquid containing 7 per cent. of alcohol. It is given in doses of a teaspoonful to children or a tablespoonful to adults, three times daily immediately preceding or at meals.

Regenerin-Tablets and Powder, on the other hand, are stated to be a combination of 14 per cent. of sodium glycerophosphate, 14 per cent. of iron lactate, and 72 per cent. of an aromatic powder—the latter serving as a stomachic and diluent. These tablets or powder are claimed to replace the "liquid regenerin" in cases in which the patient prefers the dry to the liquid form.—The dose is 1–2 tablets (size not mentioned) 3 times daily. —Pharm. Ztg., liii (1908), No. 88, 868.

Rheumose is a specialty recommended as an external remedy in the treatment of rheumatic affections, which is said to be a salicylic acid preparation containing a certain quantity of capsicin. Its efficiency is claimed to be due to the facility with which, owing to the stimulant action of the

capsicin on the cuticle, the salicylic acid is absorbed and becomes effective.—Pharm. Ztg., liii (1908), No. 95, 942.

Sabromin is the name given to the calcium salt of dibrom-behenic acid. It is recommended as a substitute for potassium bromide.—Pharm. Ztg., liii (1908), No. 78, 786.

Salvosicca are dry saline mixtures supplied by a German manufacturing firm for the extemporaneous preparation of neutral solutions, such as "Liquor Ferri Peptonati," "Liquor Ferro-Mangani Peptonati," and "Liquor Ferri Albuminati." The solutions obtained possess sufficient stability with an addition of 10 per cent. of alcohol, 125 Gm. producing 1 Kgm. of neutral sweetened "Liquor."—Pharm. Ztg., liv (1909), No. 14, 139.

Sanovagin is the name given to globules containing para-amidobenzoic acid-ethylester, β-naphtholdisulphonate of aluminum, zinc acetate, diiodsalicylic acid-methylester, mercuric oxycyanide and thymol.—Pharm. Ztg., liv (1909), No. 48, 472.

Sedlozon is a material practically identical with "Ozonal" (which see), and, like this, used for preparing ozone baths at Hallein and Berchtesgaden in Tyrol.

Somagen is a nutrient preparation of meat, which is claimed to contain the saline and basic constituents, together with the proteids of the meat employed in its manufacture.—Pharm. Ztg., liii (1908), No. 75, 739.

Sputan is a specialty claimed to contain most of the constituents of tar that are effective in tuberculosis in special combination which is claimed to increase their potency.—Pharm. Ztg., liv (1909), No. 46, 453; from D. Arzte-Ztg., 1909, No. 11.

Sturmann's Solution, used as a local anesthetic, according to "Berlin. klin. Wschr.," is composed of: Cocaine hydrochloride, 1.0; tinct. iodi decolorat., 0.3; acid. carbolic., 0.3; glycerin. puriss., 10.0; aq. distil. ad 100.0. To each gramme of this solution, 2 drops of solution of suprarenin hydrochlor. (Hoechst = 1:1000) are added.—Pharm. Ztg., liii (1908), No. 99, 983; from Südd. Apoth.-Ztg., 1908, No. 95.

Syrgol is the name given to a silver preparation which is exploited as being a non-irritant and quickly effective remedy for gonorrhœa. It is used in 1–2 per cent. solution.—Pharm. Ztg., liii (1908), No. 97, 964.

Tallianine—A New Antiseptic.—At the International Congress of Applied Chemistry (London, 1909) Dr. S. Seidman described a new antiseptic which he has named "tallianine." This is an ozonized terpene which results from the prolonged action of ozone on a mixture of terpene containing oils. It is a liquid with the odor of the oils from which it is produced. Dr. Seidman uses for generating ozone a high-tension apparatus of his own design. Tallianine was at first only used in veterinary

practice, but recently Dr. J. Gautier and other medical men have tried it on man. Tallianine is non-toxic and can be given daily hypodermically without indications of poisoning. The substance is claimed to attack invading microbes at once by its antiseptic and antitoxic action.—Chem. and Drugg., June 5, 1909, 876.

Tanargen is the name given to a preparation of silver, tannin and albumen containing 10 per cent. of silver. The preparation, which is insoluble in the juices of the stomach and difficultly soluble in the intestines, is recommended in diarrhœa, dysentery, typhus abdominalis and intestinal tuberculosis, in dose of 0.5 Gm. two to three times daily.—Pharm. Ztg., liii (1908), No. 99, 983; Pharm. Zentralh., xliv (1908), No. 51, 1141.

Tanargentan is a tannin-silver-albumen compound containing 10 per cent. of silver and 15 per cent. of tannin, and, like its numerous congeners, is insoluble in the stomach and slowly soluble in the intestinal juice. A second form, designed for infants, is supplied as

Tanargentan pro infantibus. This contains only 1.5 per cent. of silver, but a larger amount of tannin, namely, 25 per cent.—Pharm. Ztg., liv (1909), No. 49, 480.

Thiopinol is the name given to a compound of sulphur and coniferous volatile oils, which is intended for the convenient preparation of artificial sulphur bath. It is a liquid containing about 15 per cent. of sulphur in form of sulphide, and is supplied in bottles of 125 Cc. capacity, sufficient for a full bath of 200 liters of water.—Pharm. Ztg., liii (1908), No. 63, 619; from Münch. Med. Wschr., 1908, No. 30.

Thiozon is the name given to an organic sulphur compound produced by the action of linalyl acetate on sodium sulphide, which has the advantage of being devoid of unpleasant odor. It is supplied in form of a fluid representing 5 per cent. of sulphur, which is recommended particularly for preparing sulphur-baths, from 50 to 100 Cc. being required for a full bath. Thiozon is also employed in form of glycerin solutions and vaginal suppositories.—Pharm. Ztg., liii (1908), No. 85, 841.

Thymocain, a specialty recommended for dental practice, has been examined by Zernik, who finds it to be an aqueous solution of a little more than 1 per cent. of cocaine hydrochloride and 1 per cent. of sodium chloride, which, besides a small quantity of alcohol, contains apparently very small quantities of thymol and of a suprarenal preparation.—Pharm. Ztg., liv (1909), No. 46, 453.

Thyresol is the trade name given to santalylmethylether ($C_{15}H_{23}O.CH_3$), which is recommended as a substitute for santalol, over which it has the advantage of being tolerated in the stomach and free from irritant effect on the kidneys. Thyresol is a nearly colorless liquid, having a cedarwood-like odor and faint aromatic taste; nearly insoluble in water, but miscible

in all proportions with alcohol, ether, acetone, chloroform, pretroleum ether, and the fixed and volatile oils; sp. gr. 0.93–0.94 at 15° C.; b. p. 149°–156° under 16 Mm. pressure. Its use is indicated in all cases in which the various sandal oil preparations are usually employed, the dose being 0.5 Gm., administered in milk or gelatin capsules three or four times daily. The preparation is also supplied in form of tablets, each containing 0.25 Gm. of thymol in a medium of magnesium carbonate.—Pharm. Ztg., liii (1908), No. 91, 901.

Tussisolool is the name given to a cough remedy exploited in Saxony, which is stated to be practically identical with "Syrupus Bromoformii Compositus," a preparation long known and used in different European countries. When this is prepared by the formula of the Antwerp Apothecaries' Society, a preparation is obtained which bears a close resemblance to tussinol in taste, appearance and activity, This formula is as follows: Bromoform, 2.0; tinct. of aconite, 2.0; codeine phosph., 0.5; absolute alcohol, 50; purified honey, sufficient to make 1000.0.—Pharm. Ztg., liv (1909), No. 13, 129.

Valisan is a bromine compound of bornyval (Borneol-Isovalerianate) containing 25.2 per cent. of bromine, and is recommended as a sedative in place of bornyval, in form of pearls containing 0.25 Gm. each.—Pharm. Ztg., liii (1908 , No. 85, 841; from Therap. Monatsh., 1908, No. 10.

Veronal Natrium, the readily soluble sodium salt of veronal is recommended as superior to veronal in consequence of its ready absorbability and may be employed both internally and by injection with advantage. Dose: 0.3 to 0.1 Gm.—Pharm. Ztg., liii (1908), No. 64, 629.

Vesculan-Tablets, exploited as an anti fat remedy, are composed of: Extr. fuci vesiculos., 0.12; podophyllin, 0.02; extr. rhei comp., 0.12. The recommended dose is one or two tablets before breakfast and before bedtime.—Pharm. Ztg., liii (1908), Mo. 99, 983.

Wa-ka-na is said to be a distillate of four pure varieties of camphor in combination with other plant substances, and is claimed to be free from noxious ingredients. It is recommended for bathing (2–3 tablespoonfuls to a full bath); as an addition to wash-water, for mouth washes, gargles and hair washes; for insuflations in colds, as deodorant of sweat, and as an application to the brow and temples in headache.—Pharm. Ztg., liv (1909), No. 23, 231.

Ysyn is the trade name given to an albumen preparation which is designated by its manufacturer as the purest form of "milk albumen." It is a white, almost tasteless powder and according to Hoppe contains from 85 to 87.5 per cent. of albumen.—Pharm. Ztg., liii (1908), No. 99, 984.

MATERIA MEDICA.

General Subjects.

Medicinal Plants of North America—Botanical and Morphological Description.—Theo. Holm continues his excellent botanical and morphological description, profusely illustrated, of North American medicinal plants, the following papers having been communicated and printed in Merck's Report during the year:

Geraninm Maculatum, L. (Crowfoot, storksbill, tormentil, American kino, spotted geranium, cranesbill, wild cranesbill, alum root, etc.), in the July number, 1908, 172–175.

Sanguinaria Canadensis, L. (Red Indian paint, bloodroot, red puccoon, bloodwort, redroot, pauson, turmeric, tellerwort, etc.), in the August number, 1908, 209–212.

Gillenia Trifoliata, Moench. (Indian physic, Bowman's root), in the September number, 1908, 234–236.

Cimicifuga Racemosa, Nutt. (Black snake-root, rich weed, rattle weed, rattlesnake-root, black cohosh, bug bane, bugwort, rattle top, etc.), in the October number, 1908, 262–265.

Baptisia Tinctoria, R. Br. (Wild indigo, indigo weed, horsefly weed, yellow broom, rattle bush, yellow indigo, etc.), in the November number. 1908, 295–297.

Eupatorium Perfoliatum, L. (Thoroughwort, joepye, feverwort, crosswort, thorough-stem, thorough-wax, Indian sage, sweating plant, agueweed, vegetable antimony, etc.), in the December number, 1908, 326–328.

Sassafras Officinale, Nees. (Cinnamon weed, ague tree, saloup), in the January number, 1909, 3–6.

Cicuta Maculata, L. (American water hemlock, musquash root, beaver poison, spotted cowbane, snakeweed, death of man, water parsley, poison root, wild hemlock, children's bane, etc.), in the February number, 1909, 35–38.

Adiantum Pedatum, L. (Maidenhair, mowhair, rock fern, sweet fern, etc.), in the March number, 1909, 62–65.

Collinsonia Canadensis, L. (Richweed, richleaf, heal-all, horseweed, knot-root, stone-root, knobweed, horse-balm, etc.), in the April number, 1909, 87–90.

Euphorbia Ipecacuanha, L. (Ipecac spurge or wild ipecac), in the May number, 1909, 115–118.

Chimaphila Umbellata, (L.) Nutt. (Pipsissewa, prince's pine, winter-

green, bitter wintergreen, king's cure, ground holly, love in winter, rheumatism weed, etc.), in the June number, 1909, 143–145.

California Medicinal Plants.—Prof. Albert Schneider's interesting notes on the medicinal and poisonous plants of California are not ended with the April number of the "Pacific Pharmacist" of 1908, as stated in the report of that year (see Proceedings, 1908, 172), but are continued in the following numbers: May (pp. 19–22), June (pp. 83–87), July (pp. 119–121), August (pp. 144–146), September (pp. 212–214), October (?), November (pp. 270–272), December (pp. 312–314), January, 1909 (pp. 351–356), February (pp. 393–396), March (pp. 424–429), and April (pp. 463–476). The last instalment concludes this serial, begun in May, 1907, with No. 1, and ending now with No. 868, having been continued in every issue of the "Pacific Pharmacist" with the exception of that of August, 1907.

Medicinal Plants and Drug Plant Culture—Literature.—Prof. Albert Schneider, supplementary to a series of papers on *The Native and Introduced Poisonous and Medicinal Plants of California*, now being published in the "Pacific Pharmacist" (which see), cites the literature on the subject in alphabetical order of the authors. This citation covers 417 numbers, which will doubtless prove of value to interested parties in other states and territories of the United States, and is concluded with an index of subjects referring by numbers to the serial numbering of the author, citations.—Pharm. Review, July and August, 1908, 201–214 and 236–245,

Drug Cultivation in Texas is the subject of a brief communication by J. Long, of Sherman, Texas, in which he points out that many medicinal plants may be profitably cultivated in the South, and that owing to the long seasons in a far greater yield than is possible in the North with its short seasons. He had at the time of writing growing finely the following plants: Tansy, wormwood, rue, marshmallow, lemon balm, hyssop, southernwood, mugwort, belladonna, peppermint, spearmint, motherwort, parsley, benne, blessed thistle, borage, soapwood, hoarhound and catnip; he had already harvested the first crop of tansy, wormwood, rue, lemon balm hyssop, motherwort and hoarhound, and they were all sprouting up again for a second crop. All the transplanting and seed-sowing is done in the fall, during the winter and early spring, when in the North and East the ground is frozen, and there is not a day in the year when work can not be done out in the open ground.—Meyer Bros.' Drugg., July, 1908, 206.

Plants—Disadvantage of Slow Drying.—From experiments with various parts of the plants of *Sambucus nigra*, *S. laciniata*, and *S. racemosa*, E. Couperot found that these lose a considerable portion of their hydrocyanic acid, and also of their nitrates, by the process of slow drying. The loss of these ranges from 20 to 50 per cent. of the amount present in the fresh material. If, however, the parts, such as the leaves, are dried at a tempera-

ture of 60° C. immediately after they have been picked there has been practically no loss in these constituents. It seems that during the process of slow drying the cells of the plant continue to live and consume the reserve material. They are, however, quickly killed, when exposed for a short time to a high temperature. The products of slow drying had undergone no apparent deterioration, and retained their good appearance, and were unattacked by micro-organisms. The diminution of nitrates and hydrocyanic acid was not due, therefore, to secondary fermentation.—Pharm. Journ., May 15, 1909, 645 ; from Journ. de Pharm. et Chim., *29*, (1909), 100.

The National Museum in Drug Research is the title of a paper by Lyman F. Kebler and V. K. Chestnut, in which they give an account of the work accomplished and contemplated in the direction of drug research since the museum was founded in 1840. See "Proceedings," 1908, 935, 940.

The Purity of Some Official and Non-Official Drugs and Chemicals examined by them from June 1, 1907, to June 1, 1908, is discussed in a paper by A. R. L. Dohme and H. Engelhardt, which is published in the "Proceedings" of this Association, 1908, 814–819.

Sampling of Drugs and Preparation for Assay is interestingly discussed by Frank R. Eldred in the "Proceedings" of this Association, 1908, 831–834.

Drug Assay—Limitations.—In concluding a very interesting paper dealing with the gradual development and significance of the assay of drugs, C. E. Parker says that assaying the finished product does not secure a complete remedy for all the abnormalities in drugs, which may be occasioned by natural variation, accidental deterioration, or the ignorance, carelessness or cupidity of those through whose hands they pass. An assay will show, for example, how much alkaloid is present in a certain preparation, provided it is the characteristic alkaloid of the drug in question. Ordinarily it will not show whether it is that particular alkaloid or a mixture of alkaloids, nor will it usually indicate whether the original drug was mixed with other drugs or inert matter, or properly cured and in a good state of preservation. The physical examination of the original crude drug is a very important factor in controlling the quality of drug products. The process of grinding destroys many of the characteristics, and it is difficult to determine the quality of finely-ground drugs even with the microscope. The efficient inspection and control of crude drugs at the point of importation into the country is therefore a very valuable agency in preventing the distribution of objectionable drugs.—Amer. Jour. Pharm., Feb., 1909, 59–65.

Physiological Testing—Question of Standards.—In concluding an interesting address on the subject of physiological testing, in the course of

which he described the results that have been obtained in the attempts to standardize adrenalin (epinephrin), ergot, cannabis indica, and particularly digitalis, on the basis of their observed effect when administered to different animals, Albert C. Crawford observes that the methods in use in the testing of galenical preparations, as quantitative procedures, leave much to be desired. It must be remembered that because one firm calls a drug physiologically tested, it does not follow that the drug compares at all with another so-called physiologically tested preparation. In fact, the standard and ideas of testing of one firm may be very different from that of another, and no label "physiologically tested" means much unless one knows the standard used. While many of these preparations may contain full alkaloidal strength, which can be determined by chemical analysis, yet it is perfectly possible that some may be too irritating for certain usage. As is well known, one of the problems has been to obtain a digitalis preparation which is non-irritating. This irritating action can be determined by the biological test, such as is described by Houghton. Then, the question comes up as to who shall perform such tests. Pharmacists and the practicing physician certainly would not be in position to carry them out on account of the special training which these tests require. Many of the large firms are now employing professional pharmacologists to do such work. In Germany there is now a considerable movement to organize a Government Bureau for the testing of these preparations, and it will not be long before the Federal Government will be compelled to establish such a bureau.—Amer. Journ. Pharm., July, 1908, 321–335.

Adulterated Spices — Chemical and Microscopical Examination.— Edward Spaeth contributes an exhaustive treatise on the chemical and microscopical methods for establishing the identity and quality of spices and determining their adulterants, which deserves more than passing notice, since it embodies in a comprehensive form the observations that have accumulated and are distributed throughout the voluminous literature on the subject, including the following spices and condiments:

Anise, fennel, cloves, ginger, capers, cardamoms, coriander, caraway, mace, marjoram, nutmeg, paprica (capsicum), pepper, piment, saffron, mustard, vanilla and *cinnamon.* This noteworthy treatise cannot be profitably abstracted within the limited scope of this report and must therefore be consulted in the original, in Pharm. Zentralh., xlix (1908), Nos. 27–36 inclusive.*

Powdered Drugs— Water-Soluble Content a Factor in Examinations.— F. H. Alcock suggests that in the examination of drugs which do not offer anything very tangible or definite by which their value may be determined, the determination of the water-soluble content, obtained under certain

* A reprint of this paper in pamphlet form, is announced by the publishers.

prescribed conditions, may in many cases prove available as a constant upon which the valuation can be based. Such a constant would be of particular value in recognizing admixture with the dried marc of the same drug which had previously been exhausted, and which consequently cannot be discovered under the microscope—actual examples in the author's experience being ginger, logwood, quassia, gentian, etc. The sample would be treated as follows: 1 Gm. of the powder is macerated at the laboratory temperature with 100 Cc. of distilled water and 5 drops of chloroform, for 12 hours, shaking vigorously occasionally, and especially several times just before removing an aliquot part. Fifty Cc. are then filtered off and evaporated on the water-bath until the residue is reduced to constant weight. In this way, for example, four specimens of powdered gentian yielded residue weighing from 0.153 to 0.174 (average 0.166) Gm., whereas two suspected samples yielded only 0.050 and 0.070 Gm. respectively from 50 Cc. of filtrate. An extra figure is obtained by the ash determination in the insoluble residue, and it may be well also to determine the ash resulting from the incineration of the residue of evaporation. A comparison of the figures obtained with constants established by treating drugs of known purity in the same way should, in the opinion of the author, lead to the recognition of an adulterated powder, as is evident from results obtained with a number of powdered drugs (licorice, cantharides, nux vomica, acacia, quassia) described in the present paper. Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 426–430.

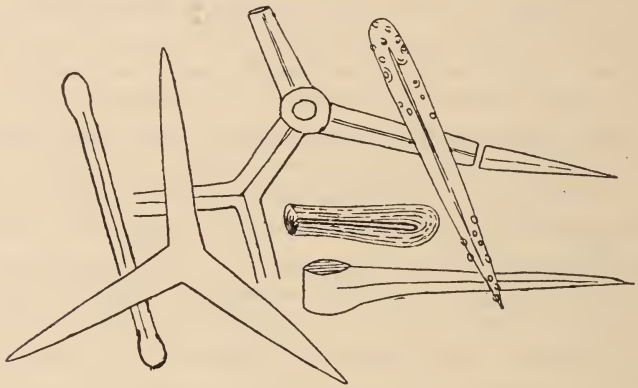
Drugs—Possibility of Electrolytic Administration.—T. Maltby Clague read a paper before the British Pharmaceutical Conference (1908) on the steps which have been taken and the progress which has been made to call into requisition electrolytic action, not only in producing some galenicals and in testing such products, but particularly in applying an electrolytic method as a possible means of putting a drug just where it is wanted. Experiments have shown that in the electric bath uric acid and oxalic acid are found at the positive pole and sodium at the negative, and Morton, Bordier and others have used this means of introducing drugs where a localized action was desired, while considerable impetus has recently been given to further research by some striking experiments of Professor Leduc, of the University of Nantes. The author's very interesting paper may be consulted in the Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 423–426.

ALGÆ.

Agar-Agar—Microscopic Detection.—O. Tunmann suggests and gives detailed directions for a modified method of the microscopic identification of agar-agar by the diatome content, in which he avoids the necessity for incinerating the substances and consequent modification in the structure of the diatomes. Furthermore, he suggests that the "spongil-needles" asso-

ciated with the diatomes, which are also composed of silicic acid, and are likewise present in infusorial earth, are quite as characteristic, and have the advantage of being more conspicuous, since they often attain a length up to 200μ by 20 to 40μ in diameter, whereas the largest diatomes do not exceed a diameter of 150 to 170μ. The straight or slightly curved spongil-needles, are now pointed at one extremity, now at both, and again they are blunt on both extremities; occasionally, also, they have a warty surface. In agar-agar, examined under water, they are now and then arranged in stellate groups as shown in Fig. 55 but after incineration they crumble into

FIG. 55.



Stellate Groups.

their axes. The number of these needles is in inverse proportion to the quality of agar-agar, the better sorts containing the smallest number, these needles being removed to a greater or less extent, along with other impurities derived from the algæ used, in proportion to the care taken in the preparation.—Pharm. Zentralh, l (1909), No. 12, 233–237.

Chondrus Crispus, Steckhouse—Constituents.—O. Tunmann communicates a lengthy paper giving the details of a study of the anatomical structure of *chondrus crispus* and of its constituents, which are characterized as follows: The so-called Floridea-starch contained in the plasma-tube of this alga is colored red-violet or wine-red by iod-zinc chloride, red-brown by iod-potassium iodide. When heated the granules of this starch unite to form a more or less homogeneous globule. This reaction has led Tschirch to designate the Floridea-starch as "amylodextrin-starch." Tunmann has, however, observed that with fresh material this reaction is less pronounced and is not manifested until after a longer time. With solution of potassium hydroxide and with choralhydrate the Floridea-starch swells readily, this serving well for the detection of mere traces. Regarding the significance of this starch, the views of authorities are at variance:

the author regards it to be an important reserve-carbohydrate. The mucilage of the algæ is colored by all basic coloring matters which color pectin-mucilage. It is not completely soluble in water, potassium hydroxide solution or chloralhydrate, even when boiled under a cover glass, some lamellæ which have not yet undergone the mucilage-metamorphosis always remaining undissolved; but the mucilage is chemically closely related to the fruit pectins. Its function, in distinction from that of the fruit pectins, is evidently to facilitate the supplementary development of the medullary cells. On the secondary cell walls, enclosing the mucilage, tertiary layers are deposited, which have some relation to amyloid, and possibly consist of pure amyloid. Apparently also, amyloid lamellæ alternate with layers of cellulose mucilage. Furthermore, the author finds that the mucilage layers attached to the exterior of the thallus, correspond in general with those in the interior, but are distinguished by their more difficult solubility in water.—Apoth.-Ztg., xxiv (1909), No. 17, 151–154.

FUNGI.

Bottom-Yeast—Supposed Toxic Effect of Rice on it.—According to the observation of Lange, although the fermentative activity of surface-yeast is accelerated by the presence of rice, bottom-yeast is killed by the presence of this cereal. The recent experiments of Uens, however, do not confirm this observation. Quite to the contrary, he finds that the presence of rice promotes the fermentative activity of bottom-yeast also in some degree, and in a particularly high degree after it has been treated with pepsin.—Pharm. Ztg., liii (1908), No. 91, 901; from Jour. d. Pharm. Ges. v. Japan, 1908, No. 318.

Ergot—Review of its Galenical Preparations.—Prof. R. Kobert interestingly and comprehensively reviews the various ergot preparations which have from time to time been proposed, beginning with the "ergotin" proposed by J. Bonjean in 1842 and bringing them down to the present day. This review which is a reprint from the author's "Real-Enzyklopädie der gesamten Pharmazie" (2nd ed.), cannot be profitably condensed, but may be consulted in Pharm. Ztg., lii (1908), No. 85, 839–840.

Ergot—New Method for Chemical Assay.—In a preliminary communication, Dr. H. C. Wood states that while engaged in working on the physiological standardization of ergot he was struck with the fact that a fluid extract which had been found physiologically inert gave almost no precipitate on the addition of water. This observation suggested the possibility of there being some relation between the physiological activity of ergot and the amount of resin it contained, and following up this idea he has demonstrated the apparent fact that some such relation does exist. On shaking out the fluidextract diluted with twice its volume of water, with

repeated portions of benzene, until the benzene used remained colorless, the amount of resin was determined in eleven samples of fluidextracts and some other galenical preparations of ergot. The yields varied from 0.68 per cent. of benzene extract to as little as 0.06 per cent., the latter proving physiologically inert, whereas the former gave under the conditions of the physiological test a rise of 33 Mm. of blood-pressure. Intermediate results (selected for this abstract) were 0.52, 0.45 and 0.34 per cent. benzene extract, and a rise in blood-pressure respectively of 30, 20 and 12 Mm. Moreover, the same fluidextracts gave smaller yields of benzene extract and correspondingly lower indications of physiological activity when they were not preserved in hermetically-sealed bottles and had been exposed to the air, the benzene extract being reduced in these instances from 0.68, 0.58 and 0.48 per cent. to 0.39, 0.37 and 0.34 per cent., and the physiological activity from 33, 32 and 22 to 13, 10 and 12 Mm. blood-pressure, respectively. The author describes the body extracted by benzene as being a golden-yellow, resin-like mass, soluble in ether, alcohol, acetic ether and benzene, insoluble in petroleum ether, water or dilute acids, but readily soluble in solutions of the alkali hydroxides with evidence of chemical change. In these and other properties this body corresponds with that separated from ergot in minute quantities by Jacobi, to which he gave the name "Sphacelotoxin." Dr. Wood finds, however, that shaking out with benzene does not completely remove the active matter from the drug, and regards this as evidence that there is a second principle, perhaps an alkaloid, which is not dissolved by the benzene.—Amer. Jour. Pharm., May, 1909, 215–218.

Ergot—Characters of Fixed Oil.—A. Rathje has extracted the oil from ergot by ether, and gives a description of its characters and constants: It is a dark brown liquid, of specific gravity, 0.925; index of refraction, 1.4685; saponification value, 178.4 to 180.2; acid value, 11.31 to 11.46; ester value, 167.9; iodine value, 73.4 to 74.5; Hehner value, 95.84 to 96.6; Reichert-Meissl value, 27.43 to 31.38; acetyl value, 27.43 to 31.38; true acetyl value, 27.44; glycerin, 7.9 to 8.1 per cent.; unsaponifiable matter, 0.36 per cent.; ash, 0.2 per cent.; alkaloids, 0.6 per cent. The alkaloids were removed by shaking out the oil in chloroform solution with aqueous hydrochloric acid. When liberated with alkali and removed by ether, the mixed bases were obtained as a brown resinoid mass, with a strong odor of pyridine. They were not further examined. The fatty acids of the oil had the following characters: Melting-point, 38.39° C.; saponification value, 182.9 to 183.1; iodine value, 77.1 to 77.3; mean molecular weight, 307. These fatty acids consisted of: Oleic acid, 68 per cent.; oxyoleic acid, 22 per cent.; and palmitic acid, 5 per cent.—Arch. d. Pharm., *246* (1908), No. 9, 696–698.

Polyporus Ignarius—Chemical Examination.—Julius Zellner has sug-

gested *Polyporus ignarius* to chemical investigation, and finds this fungus resemble in its chemical constituents the fungus *Trametes suaveolens* previously examined by him. It contained from 70 to 75 per cent. of water and yielded about 8 per cent. of ash, calculated on the perfectly dry material. The petroleum ether extract, 1.08 per cent. of the dry material, was a mixture of ergosterin and a fat with the acid value 87.80. The ether extract, 0.92 per cent., contained a resin, but no fumaric or malic acid. In the alcoholic extract 1.4 per cent. phlobaphene, mannite and glucose were detected. The water-soluble extract, 7.76 per cent., contained calcium sulphate, carbohydrates, and traces of albuminoids. On distilling the fungus with dilute alkali, amanitol and a minute trace of amine bases was obtained, recognizable only by the odor. The principal distinction of the two closely related fungi consists in the presence of mycose in the cellular contents of *Trametes*, while polyporus contains mannite and tannin which are absent in the other.—Apoth. Ztg., xxiv (1909), No. 12, 111; from Monatsh. f. Chem., *29* (1908), 1171.

LICHENES.

Cudbear—Conditions of Utility as a Coloring for Pharmaceutical Preparations.—The only method of using cudbear as a coloring which G. M. Towle has found satisfactory is to macerate the powder in the preparation for four or five days. Cudbear, he says, requires a large volume of menstruum to extract the color properly and this will probably prevent the use of its coloring solutions to any extent. While there is some complaint of variable tinctorial power in cudbear, yet the author has used many samples of the drug, by the maceration method, in manufacturing pharmaceuticals, without any appreciable difference in the color of the products. Proc. Ohio State Pharm. Assoc., 1908, 55.

In the discussion following the reading of the above paper, W. T. Hankey remarked that it is the practice of most manufacturers to macerate the cudbear in the preparation that they want to color. They get better results that way; but the factor they all have to reckon with is the varying quality of the cudbear. He has seen samples of cudbear that ran perhaps 60 to 70 per cent. salt—which comes into it naturally in extracting the cudbear. He thinks it is customary to use alkali in its manufacture, and then neutralize with oxalic acid; and the salt is there when they precipitate out the color. His experiments along the line of improving the tincture seemed to show that ammonia was about the best solvent to use. Extract the cudbear with ammonia, and it would stand the acid solution all right; it did not make much difference whether you boiled it even over the open flame; then add just as much alcohol as is necessary to preserve it. Alcohol will extract the tint as well as alkali. It is very soluble in any alkali.—*Ibid.*, 58.

FILICES.

Lycopodium — Characters of Fixed Oil.—By extracting lycopodium spores with chloroform, A. Rathje obtained 49.2 per cent. of a deep green fixed oil, having an acid reaction and the following characters and constants: Specific gravity, 1.9361; index of refraction, 1.4671; saponification value, 194.5 to 195.4; acid value, 18.6; ester value, 176.4; iodine value, 80.85 to 81.17; Hehner value, 87.95 to 88.01; Reichert-Meissl value, 7.3; acetyl value, 53.6 to 54; true acetyl value, 44.1; glycerin, 8.3 to 8.5 per cent.; unsaponifiable matter, 0.43 per cent.; ash, 0.03 per cent. The fatty acids had the following characters: Melting-point, 39 to 40° C.; saponification value, 201.8 to 202.1; mean molecular weight, 278; iodine value, 91.7 to 91.9. These fatty acids consisted of: Lycopodium-oleic acid, 81 per cent.; lycopodic acid (dioxystearic acid), 3.2 per cent.; palmitic acid, 0.85 per cent.; and myristic acid, 2 per cent.—Arch. d. Pharm., *246* (1908), No. 9, 699–702.

PALMACEÆ.

Areca Nuts—Characters of Fat Extracted by Ether and by Petroleum Ether.—A. Rathje prepared the fat from areca nuts by extracting one portion with ether and another with petroleum ether, and subjected them to examination, with results as follows:

Ether-Extracted Fat.—This was mottled reddish-brown and had a nutmeg-like odor; specific gravity, 0.884; melting-point 36°–37° C.: saponification value, 227.4; acid value, 91.1; ester value, 136.3; iodine value, 24.3; Hehner value, 92.76; glycerin, 5.3 per cent.; acetyl value, 15.1; true acetyl value, 11.2; unsaponifiable matter, 1.12 per cent.; ash 0.02 per cent. The fat contained phytosterin, and traces of alkaloids. The fatty acids melted at 39° C, saponification value, 229.6; mean molecular weight, 244.6; iodine value, 25.95. These acids consisted of stearic acid, 2.25 per cent.; palmitic acid, 3.1 per cent.; myristic acid, 21 per cent.; lauric acid, 43 per cent.; capric acid, 1 per cent.; oleic acid, 29 per cent. The

Petroleum-ether-extracted Fat was yellowish white, almost odorless, and had the following character and constants: Specific gravity, 0.973; melting-point, 37°–38° C.; saponification value, 234.6; acid value, 97.2; ester value, 137.4; iodine value, 12.3; Hehner value, 91.45; Reichert–Meissl value, 4.2; glycerin, 5.2 per cent.; acetyl value, 18.2; true acetyl value, 9.81; unsaponifiable matter, 1.01 per cent. The fat contained but little phytosterin and no alkaloids. Its fatty acids had the following constants: Melting-point, 39°–40° C.; saponification value, 235.5; mean molecular weight, 238.5; iodine value, 13.6. These acids comprised stearic acid, 3.3 per cent.; palmitic acid, 24.7 per cent.; myristic acid, 24.7 per cent.; lauric acid, 53.3 per cent.; capric acid, 1 per cent.—Arch. d. Pharm., 246 (No. 9, 702–706.)

SMILACEÆ.

Medeola Virginica—Proximate Constituents of the Fruit.—Lois R. Poyneer and H. Leroy Duffin have determined some of the proximate constituents in the fruits of the "Indian cucumber" (*Medeola virginica*) gathered at Sylvan Beach, N. Y. Only about one-half the fruit seemed ripe. It was dried in an oven at 105° C. Each fruit averages about 0.05 Gm. (?) in weight. They are about the size of currants, dark brown, almost black in color. There is on each a rather hard outer shell, and within this are six to twelve small nutlets which are very hard, and are dark-colored like the outside of the fruit. These fruits contain an abundance of fermentable sugar, apparently fructose, and the nutlets about 10 per cent. of a fixed oil, having the saponification-number, 254.88; the specific gravity, 0.935, and other characters that correspond well with the oils of the marine group, and particularly with porpoise oil. The ash amounted to 3.91 per cent. of the fruit.—Chem. News, Feb. 26, 1909, 99–100.

Sanseviera Thyrsiflora—A South African Medicinal Plant.—C. E. Oliver describes a South African medicinal plant, called by the natives "isi-kolokoto," which is much esteemed by them for various ailments, but chiefly for piles, for which it is said to be infallible. The plant is *Sanseviera thyrsiflora* (N. O. smilaceæ), and is widely distributed in the eastern portion of Cape Colony, growing socially under the shade trees, and particularly among the dense bush-lining of the water courses. It spreads by means of fleshy underground stems, as shown by a drawing accompanying the author's paper, which are the parts used medicinally, and the plant is easily recognized by its lanceolate, evergreen, leathery-looking leaves, which are 1 to 3 feet in length, and the ease with which its creeping underground stem, at no great distance below the surface, may be pulled up. Growing in favorable situations, it produces a fine spike of greenish flowers, followed in the autumn by bright red, one-seeded berries. When gathered at the correct season and properly prepared, it appears to be a mild and agreeable laxative, free from bitterness and unattended by griping or nausea. When the fresh rhizome is bruised in a mortar, the fiber, which is tough, separates in a tangled mass from the pulpy portion. The expressed juice has a slightly sweetish taste and an acid reaction. It readily reduces the copper in Fehling's test, and when filtered the clear juice yields a flocculent precipitate on boiling and precipitates heavily with lead acetate. Anhydrous ether extracts from the dried drug a small quantity of fatty substance having the color and smell of palm oil.—Chem. and Drugg., Jan. 2, 1909, 21–22.

LILIACEÆ.

Sicilian Aloe—Chemical Examination of the Juice.—Condò-Vissicchio has subjected the juice exuding from the leaves of *Aloe vulgaris*, growing throughout Sicily, to chemical examination. He finds that the fresh juice

does not give the Bornträger reaction, but that this reaction is obtained after prolonged standing. Inasmuch as this reaction is due to the presence of emodin, the author concludes that this body does not pre-exist in the juice, but that it is formed by the action of the air, probably with the aid of oxydases present. The pale-yellow juice gradually turned brown, and had a sp. gr. of 1.06 to 1.08. The content of solid substance was not uniform, and the ash content varied in conformity with this. On evaporating the juice the resulting aloes proved to be very rich in alein. This, in conformity with the usual practice, the author designates as "sicaloin," which nomenclature is further justified by some differences in its reactions from the other aloins. The aqueous solution, cold or warm, was colorless, and remained colorless with Klunge's reaction, while Bornträger's reaction, in the cold as well as heat, Schonteburg's reaction and the iodic acid reaction gave negative results. The aloes obtained by the author contained 85 per cent. of aloin, 1.90 per cent. of resin (including amorphous substances insoluble in water), 0.08 per cent. of emodin, 4.5 per cent. of ash and 8.02 per cent. of water. The elementary analysis of sicaloin leads to the formula $C_{15}H_{20}O_7$. An oxymethyl determination by Zeissl's method indicates the presence of an oxymethyl group. The author expresses the opinion that the differences heretofore noted in the aloins is not alone from the different methods of preparation, but largely to the variable conditions of vegetation under which the plant develops. He believes with von Mueller that the cultivation of aloe in Sicily promises to become successful.—Arch. d. Pharm., *247*, No. 2 (April 3, 1909), 81–95.

Colchicum Corm—Simple Gravimetric Method of Assay.—A. B. Lyons finds the following simple method for the gravimetric assay of colchicum corms to be rapid and reasonably correct. The alkaloid obtained will be found to be remarkably free from impurities, and the result of the assay will agree well with that obtained by the official assay method: Place in a small beaker 25 Gm. of colchicum corn in moderately fine powder. Add 15 Cc. of solution of lead subacetate, U. S. P., and 80 Cc. of warm distilled water, and macerate with occasional stirring for six hours at a temperature of about 50° C. Transfer to a small percolator (a funnel answers the purpose well), having the tube so packed that percolation will go on at the rate of about 2 Cc. per minute. When the fluid has disappeared from the surface of the drug, add warm water, about 20 Cc. at a time, and so continue the percolation until 250 Cc. of fluid has been collected. This should practically exhaust the drug. To the percolate add 5 Gm. of powdered sodium phosphate, or enough to precipitate the whole of the lead present in the percolate. Filter, returning the first portion of filtrate if it is not quite clear.

Use for duplicate assays two portions, 100 Cc. each, of the filtrate, representing 10 Gm. of drug. Shake out each portion with three succes-

sive portions of chloroform, 25, 20 and 15 Cc., or enough to extract the whole of the colchicine. Evaporate off the chloroform and treat the residual alkaloid repeatedly as usual with alcohol to remove persistently adhering traces of chloroform, dry at a temperature below 100° C. to constant weight, and weigh. The weight of the alkaloid in grammes multiplied by ten gives the percentage of colchicine in the drug. This may be confirmed by titration with Mayer's reagent, by a procedure which is decribed by the author, in an alternative volumetric process, and may be consulted in the original.—Amer. Drugg., Feb. 8, 1909, 65.

DIOSCOREACEÆ.

Dioscorea Macahiba—Chemical Examination of the Tubercule.—E. Bourquelot and M. Bridel have made a chemical examination of the fresh tubercule of *Dioscorea macahiba*, but found neither alkaloids nor glucosides. Its constituents were: Moisture, 81.621; ash, 1.141; reducing sugar, 0.045; saccharose, 0.111; starch, 6.805; nitrogen, 0.482 per cent. It contained a small amount of amylase, and an anæroxydase, some invertin, but no emulsin.—Pharm. Journ., Jan. 9, 1909, 32; from Journ. de Pharm. et Chim., *28* (1908), 494.

IRIDEACEÆ.

Saffron—Constituents.—Pfyl and Scheitz communicate the results of an experimental inquiry concerning the constituents of saffron, which demonstrated the presence of three distinct crystallizable bodies in the petroleum ether and chloroform extractions of the stigmata. One of these, which resembles the body described by Kayser under the name of "picrocrocin," yields on hydrolysis a volatile oil having an odor of saffron, and a sugar, presumably fructose. The "crocin" described by other authors was not obtained in a pure condition, nor could it be obtained in a crystallized state. It was apparently contaminated with a glucoside body.—Pharm. Ztg., liii (1908), No. 91, 900; from Ztschr. f. Unters. d. Nahr. u. Genussm., xvi (1908), No. 6.

Saffron—New Method of Valuation.—In the course of their above-mentioned investigation of the constituents of saffron, Pfyl and Scheitz have determined a method for its valuation which depends upon the reducing action of a chloroform extract of the stigmata on Fehling's solution. Referring to the original for details, the method briefly consists in extracting the fat from a carefully dried and weighed portion of the powdered saffron by means of petroleum ether in a Soxhlet extraction apparatus; then, after drying the cartridge, extracting it in the same way with chloroform. The chloroform is distilled off, the brown residue is dissolved in hot acetone, a little water is added to the acetone solution (25 Cc. for 5 Gm. of saffron used), and, after evaporating the acetone, the aqueous liquid is hydrolyzed by boiling for 15 minutes with 5 Cc. of

normal hydrochloric acid. The sugar then split off from the glucosidal constituent of the saffron is then determined by Allihn's method with Fehling's solution is the usual way, the weight of cuprous oxide produced being calculated as metallic copper. 5 Gm. of pure saffron should thus not yield less than 0.1500 Gm. of copper.

In a series of experiments made with a number of commonly used adulterants of saffron (such as crocus-pistils, sandalwood, turmeric, logwood, flor. rhæados, flor. pæoniæ, honey, flor. calendulæ and flor. carthami) no glucose reaction was obtained, or at most only a minute separation of cuprous oxide under the conditions of the method described.—Pharm. Ztg., liii (1908), No. 89, 879; from Ztschr. f. Unters. d. Nahr.-u. Genussm., xvi (1908), No. 6.

Spurious Saffron—Dyed Calendula Flowers.—Frederick E. Niece calls attention to a parcel of saffron labeled, as ordered, "Spanish Saffron-Alicanti," which proved on examination to consist wholly of calendula flowers highly colored with aniline red.—Proc. Penn. Pharm. Assoc., 1908, 274–276.

Saffron—Adulteration with Sodium Carbonate.—Dr. G. Weigel has had opportunity to examine a number of specimens of saffron, offered at a remarkably low price, which, although composed of genuine stigmas and free from foreign vegetable matter, was devoid of the soft, elastic properties characterizing the drug, exhibiting instead a brittle and cartilaginous appearance, while the taste was faintly alkaline. On incineration, these samples yielded respectively 17.25, 20.70 and 30.75 per cent. of ash, whereas pure, genuine saffron yields from 5 to 8 per cent. This increase, which was in direct relation to the gradation in price, proved to be due to sodium bicarbonate with which the genuine saffron had been impregnated. While the adulteration of saffron by weighting with inorganic salts, such as Glauber's salt, saltpetre, etc., and also with milk sugar, has been previously observed, the use of sodium bicarbonate for this purpose has not heretofore been noted.—Pharm. Zentralh., xlix (1908), No. 48, 977.

AMOMEACEÆ.

Arrow Root—Production from Canna Edulis in Queensland.—According to "Agricultural News" (*8*, p. 119), the arrow root produced in Queensland is not obtained from *Maranta arundinacea*, but from *Canna edulis*, the plant which yields *Tous les mois* starch. About 200 acres are given up to its cultivation, the yield being 15–20 cwt. per acre. The annual produce is about 600,000 lbs., which, however, fetches only 3d. per lb. in the London market, and is therefore used in Queensland for laundry purposes instead of the higher-priced imported starch. The Canna arrow root is known in Queensland as purple arrow root, to distinguish it from Maranta arrow root, which is produced also to a small ex-

tent and is known as white arrow root. The yield of starch is considerably less than that of Canna, and as no higher price can be obtained for it, the plant finds little favor with agriculturalists. The Canna arrow root contains a little more moisture, and the maranta variety more fiber. The rhizomes of *Canna edulis* are planted out in Queensland from September to December. They are set in rows at six feet apart, allowing four feet between each plant. In six or eight months the rhizomes are mature, and are then dug up, carted to the mill, washed and grated to pulp in a grinder or perforated wooden drum. The pulp is then mechanically conveyed to a sieve of perforated metal, and then washed with a stream of cold water. Similar devices are adopted for further purification, and the arrow root is then dried on calico cloth in the sun. The whole process takes about twenty-four hours.—Pharm. Journ., June 5, 1909, 768.

Commercial Ginger—Microscopical and Chemical Examination.—Henry Kraemer and Harry E. Sindall publish the results of a pharmacognostic, microscopical and chemical examination of the commercial varieties of ginger, both whole and in the ground or powdered state, undertaken with the object of establishing their identity and purity, and to detect adulterations in the powdered drug. The principal commercial gingers which are coming into the market at present are African, Calcutta, Calicool, Cochin, Jamaica and Japan, which are shown in illustration (one-half natural size) and in transverse sections, exhibiting the characteristic microscopical features by which their rhizomes may be distinguished from each other. The distinctive characters of the starches and sclerenchymatose fibers are also shown, as also the principal microscopic elements usually observed in the adulterated gingers. The results of the chemical examination, which was the special charge of Mr. Sindall, are given in a number of tables, covering samples of the different commercial sorts of ginger of known purity and samples of commercial powders. From the data obtained in both the microscopical and chemical examination of the samples of commercial powdered ginger and those of known purity, the conclusion is reached that commercial powdered ginger may conform to the official standards and yet be adulterated or contain exhausted ginger, or on the other hand be pure and yet vary slightly in the percentage of ash. It would seem, therefore, that there should be different standards for ash in the different sorts. In forming an opinion as to the quality of powdered or ground commercial ginger the following points should be borne in mind:

1. The powder should be uniformly granular and have a pronounced characteristic aromatic odor and a characteristic pungent taste.

2. On treatment with sulphuric acid, the particles of genuine ginger become of a reddish-brown color, which changes rapidly to dark brown and finally to purplish-brown.

3. With phloroglucin and hydrochloric acid few or none of the fragments should be stained a cherry-red color.

4. Of the official standards, those for the total ash and crude fiber are the most important. The latter is of special importance if the microscopic examination with phloroglucin shows the presence of liquefied tissues.

5. The volatile ether extract should not be less than 3 per cent.—Amer. Journ. Pharm., July, 1908, 303–321.

Turmeric—Comparative Color Value.—W. G. Pearson and F. A. Coleman have determined the comparative color value of commercial sorts of turmeric, which enters our market in two forms, as "fingers" and as "splits." Four samples were examined, one of "splits," one of "Madras fingers," and two of "Pubna fingers." The splits gave a brownish yellow powder, the Madras fingers, a powder of a bright yellow color; the Pubna fingers a brownish-red powder, of much deeper shade than either of the other varieties. The tinctures obtained by extracting 5 Gm. of the respective powders in a Gordin extraction percolator with alcohol, and adjusting the percolate to 125 Cc., were least intensely colored in that made from the splits, of a beautiful bright yellow color in that made from Madras fingers, while those made from the two samples of Pubna fingers had a brownish-red appearance, and the color was about two and one-half times as intense as that of the other two. The more expensive Madras fingers, while superior in color, are therefore only about two-fifths as intense as Pubna fingers. It is reported that powdered turmeric is now on the market artificially colored with a yellow aniline dye.—Proc. Penna. Pharm. Assoc., 1908, 291–292.

ORCHIDEACEÆ.

Vanilla—Eruption Caused on Handling the "Beans."—Claveric states that workmen who have to handle vanilla "beans" are subject to an eruption, generally local, and occasionally general and intense. The latter occurs as a papulo-erythematous eruption, first attacking the hands, then spreading to the face and neck, assuming the appearance of erysipelas. The local form is limited to the hands or other parts, and is accompanied by intense itching, and sometimes becomes chronic. The acute form may be associated with headache and more or less functional disturbance, but not of a severe nature. These effects have been attributed to acari, to parasitic fungi on the vanilla, and to substances used to adulterate or preserve vanilla, such as formalin. The author, however, considers the oily exudation of the pods to be the cause of the irritation. The prophylactic measures to be taken to prevent the occurrence of this disease are thorough washing of the hands after handling the pods, and efficient ventilation of the warehouses where vanilla is manipulated.—Pharm. Journ., Nov. 14, 1908, 626; from Journ. de Pharm. et Chim. Suppl., 1908.

LAURACEÆ.

Camphor—Cultivation.—The following interesting information concerning the experiments made in different countries with the object of determining the practicability of profitable camphor-tree cultivation is taken from a review in Schimmel's Report of numerous papers which have recently appeared on the subject:

Formosa.—Recently a government expert discovered a forest rich in camphor to the south of Arizan, a mountain which, according to Davidson's map in his "The Island of Formosa," is situated about 23° 25′ N. lat. and 120° 50′ E. long. A further favorable development of the Formosan camphor industry is anticipated from this fact.—Chem. & Drugg., *72* (1908), 766.

Japan.—According to Cayla, the cultivation of camphor in the Korean island Queepart has been commenced, but in view of the slow growth of the tree it is the intention of introducing there either the Borneo camphor tree or the rapidly growing *Blumea balsamifera.*—Journ. d'Agricult. tropic., *8* (1908), 96.

Burmah.—Successful cultivation experiments have recently been made in the parts of upper Burmah which are adjacent to the Chinese province of Yunnan.—Rep. of the German Consul-General in Calcutta.

German East Africa and India.—F. O. Koch states that of some 70,000 to 80,000 young plants, from seeds sown in July, 1905, and transplanted in November, when they were about 5 inches high, about 90 per cent. perished, as they were too small, but the subsequent development of the surviving plants was on the whole satisfactory, some attaining at the end of 1905 a height of 3 feet. The plants thrived best in a damp habitat, even in water-holes. The plants had been set out 6 feet apart each way, so that other trees (cedar, mahogany, etc.) could be planted between them, but nothing is as yet known with certainty regarding the effect of distance between the plants on the subsequent development. With reference to camphor cultivation in India, Mr. Koch reports that, according to D. Sandmann, the seedlings are planted out as soon as they are 15 inches high; after 2 or 3 years the young shoots and leaves can be distilled either in the fresh state or after drying in the sun. The yield from 1300–1400 shrubs ripe for cutting has been found to be 144 pounds of camphor and 36 pounds of oil.—Seifenfabrikant, *28* (1908), 280.

Italy.—By a process based on the Japanese method of distillation, which is described in detail, Giglioli has determined the camphor content in the leaves of numerous camphor trees growing in various parts of Italy, and some cases also in the wood and branches. From the voluminous data obtained in this work—the experimental part comprising about 80 pages of a report containing 300 quarto pages—the author draws the conclusion

that the cultivation of the camphor tree can be recommended for every part of Italy, excepting the interior, and the cooler northern provinces (Piedmont, Lombardy, Venice, etc.). The coast districts are to be preferred, but only those which are exempt from drought and inclement winds. If the conditions of the soil and climate are favorable, the tree grows rapidly. It can be propagated by sowing out seed, or by shoots or layers; the first method leads but slowly to the end in view and produces plants in which the camphor content varies, whilst the propagation by shoots and layers promises quicker results. As a rule, the camphor-content of the fresh leaves in Italy is 1.20 per cent. (in some districts 1.50 to 1.80 per cent.) of camphor and about 0.5 per cent. of oil, and the leaves do not suffer any loss of camphor on drying, their content then fluctuating between 2.40 and 3 per cent. The wood of the tree contains only from 0.02 to 0.25 per cent. of camphor. In practice, 100 kilos of fresh leaves will yield 1 kilo of camphor, if the Japanese distillation method is used. A full-grown tree, from 15–20 years old, supplies annually about 35 kilos of leaves, older trees possibly as much as 50 kilos. Basing his calculations on these figures, the author concludes that some 20 million full-grown trees would be required to produce the world's demand (5 to 6 million kilos) of camphor, a number which about equals that of trees of the citrus species at present commercially utilized in Italy. (La canfora italiana, Rome, 1908.)

Algeria and Northern Africa.—Rivière, a scientist who has occupied himself for the last 15 years with the cultivation of camphor trees in the Mediteranean region of Northern Africa, takes a more sceptical attitude with regard to camphor cultivation, summing up his conclusions in the following sentences:

The quantities of camphor determined up to the present in the leaves of individual camphor trees, are insufficient, if not *nil.*

The method of cutting off the leaves regularly is expensive and harmful to the tree.

To plant an area of several acres is an expensive matter, as it has to be done in a good and well-kept soil, which (at least in North Africa) must be watered for several years.

The plants used for the cultivation must be grafted, a subject of which very little is known up to the present.—(Journ. d'Agricult. tropicale, *8* [1908], 129.)

Florida.—With the object of planting camphor trees in Florida a company has recently been organized, and is now the owner of areas with about 500,000 trees from 1 to 3 years old. L. Lewy, the prospective president of the company expresses a favorable opinion on the probable development of the undertaking, based on an examination of a sample of camphor from there. It is claimed that soil, climate, and physical con-

ditions are specially suitable for the cultivation of camphor trees.—(Chem. & Drugg., *72* [1908], 915).—Schimmel's Rep., Nov., 1908, 29–38.

Camphor—Production in Formosa.—According to a recent report of Consul J. R. Arnold, of Tamusi, the manufacture of camphor in Formosa is confined to trees of upward of fifty years of age. The camphor bureau prohibits the cutting down of trees of a less age than fifty years. Although investigations as to the number of old trees in the island are not as yet completed, the number of these trees is far less than investigations a few years ago made it appear. Recent investigations warrant the statement that the supply of old trees will, at the present rate of cutting, become exhausted in less than fifty years. The old trees now standing are confined to the mountainous eastern half of the island, in regions for the most part still under control of savage tribes. The work of subjugating these tribes is difficult, and one requiring much time. At the present rate of subjugation it will be many years before their territory can be safely exploited. Besides the subjugation of savage tribes, there are other difficulties to be overcome. These mountains are covered with dense jungles, and the work of building roads in order to render the camphor forests accessible to profitable exploitation is one requiring the expenditure of much labor and time. Since 1900 the government has planted about 3,000,000 young trees, and has arranged to add another 500,000 to this number during the present year. It is expected to be able to plant 750,000 each year after the present year. Trees planted in the mountainous districts are set out with the idea of prohibiting their utilization for camphor production for a period of forty or fifty years. Those which are planted on the lowlands are set close together in rows with the idea in view of utilizing their leaves, after they have attained a ten years' growth, in the manufacture of the crude camphor. The lowlands planted in camphor are designated as camphor gardens rather than as camphor forests. Beyond an occasional clearing of the ground about the young tree it requires no attention in the way of cultivation or irrigation. There are many varieties of worms which tend to attack the young plants, but the government experts report that but six trees out of each 1,000 planted die. There are two varieties of trees—the camphor-producing tree and the camphor-oil producing tree. The former is the more valuable. It requires an expert to detect the difference between these two varieties in the standing trees. The camphor oil produces but 0.49 of its weight in camphor. The government nurseries furnish young plants to the schools, villages and agricultural societies desirous of planting the camphor trees, and many such have availed themselves of this offer.—Nat. Drugg., Dec., 1908, 386.

Camphor Trees Cultivated in the West Indies—Yield of Oil on Distillation.—Watts and Tempany have obtained the following yields of volatile

oil from the wood, leaves and twigs of camphor trees grown in the botanical gardens of Dominica: *From the wood:* 90 lbs. yielded 7.1 fl. ozs. of oil; sp. gr., 0.9012; opt. rotation, $(a)_D = -13° 1'$. *From the leaves and twigs:* 33 lbs. yielded 2.75 fl. ozs. of oil; sp. gr., 0.9024; opt. rotation, $(a)_D = -18° 4'$; but from another lot of leaves and twigs: 29 lbs. yielded 6.2 fl. ozs. of oil; sp. gr., 0.8987; opt. rotation, $(a)_D = -19°$. The low yield of oil from the first lot of leaves and twigs is attributed to insufficiency of condensing apparatus. All the distillates were clear and colorless, and even during the cooling deposited no camphor, proving that the oil cannot contain any considerable quantity. In explanation the authors mention that in his annual report for 1906, Consul Playfair pointed out that the occasional absence of camphor in the oil was ascribed by theorists to the location, assuming that only those camphor trees which grow near the coast attain their full development, while others declare that only the male camphor trees contain camphor.—Schimmel's Rep., April, 1909, 25–26; from West Ind. Bull., 9 (1908), 275.

Camphor—Preparation from Leaves which have been Shed Naturally.—According to Gigliola it is not necessary to remove the newly-grown leaves from the camphor tree, thereby checking its growth, since a satisfactory yield of camphor may be obtained from its leaves which have been shed by the tree and have been dried naturally by exposure to the atmosphere. The loss caused by this natural drying process is not considerable, but artificial desiccation may cause a loss of camphor-content up to 50 per cent. Schimmel & Co. observe that the suitability of the dry leaves for distilling purposes is of interest, because the fact would appear to make it possible to press the leaves for transport to distilleries situated in suitable localities.—Schimmel's Rep., April, 1909, 25.

Camphor Trees Cultivated at Dominica—Yield of Oil from Camphor Leaves—Profitable Camphor Content.—The investigation of the leaves of a camphor tree growing in the open air in the botanical gardens of Bordeaux lead Le Beille and Lemaire to the conclusion that the cultivation of the camphor tree is a profitable undertaking in all localities in which the climatic conditions permit its growth. The leaves contain an average of from 1 to 2 per cent. of camphor, which may be extracted from a considerable proportion of the foliage without injury to the plant by its removal.—Pharm. Ztg., liii (1908), No. 64, 627.

East African Cinnamon Bark—Characters.—Dr. G. Weigel has examined several specimens of cinnamon bark received from Amani, German East Africa. The light brown, compact bark exhibits close resemblance to Chinese cinnamon bark, the more particular since the outer portions (cork and inner bark) are not scraped off. This was also true of the taste, which however is less sweetish and aromatic than that of Chinese cinnamon, and somewhat harsh and mucilaginous. According to in-

formation received, the African bark is derived from *Cinnamomum zeylanicum*, Breye, and if this is confirmed, the observations exemplify again distinctly the possible influence of soil and climatic conditions on the development of plants. The ash of the African cinnamon amounted to 3.3 per cent.—Pharm. Zentralh., xlix (1908), No. 47, 962.

Massom Bark (?)—*A Spice-bark From New Guinea.*—Dr. G. Weigel calls attention to a spice-bark which, under the name of "Massom-bark" has recently been received from New Guinea. The odor and taste of the cinnamon-brown bark is agreeably spice, reminding of cloves, but its value as a spice is doubtful. It is conjectured that the bark is identical with the "Massoi-bark" described by Hartwich in his "Die Neuen Arzneidrogen," (1897). A volatile oil from "Massoi-bark" prepared by Schimmel & Co. in 1890 (see Proceedings, 1890, 590) was found to contain besides pinene, limonene, dipentene, eugenol and safrol. The bark is probably derived from one or more species of *Cinnamomum* indiginous to New Guinea,* such as *Cinnamomum xanthoneuron*, Bl., *C. Kiamis*, N. v. E., and others. It is used by the natives both as a condiment and spice, and as a medicine in fever, diarrhœa, colic, etc.—Pharm. Zentralh., xlix (1908), No. 47, 956.

MYRISTICACEÆ.

Myristica—Two New Species from Madagascar.—Heckel describes two new species of *Myristica*, both derived from the province of Farafangana in south-eastern Madagascar—the one known by the natives as "Voapary," the other by the name of "Moltradrago." The species known as

Voapary, is a tree attaining a height of 15 meters, growing singly in the midst of dense forests, and preferring solid soil, neither sandy nor moist. It flowers in November and December and the fruit ripens in January and February, resembling that of *Myristica fragrans*, although the plant yielding it is apparently identical with *Myristica vouri* (*Brochoneura vouri*, Warb.), the fruits of which have been described by Baillon. These fruits are particularly interesting on account of their fragrance, reminding of that of *Myristica aromatica*, Lk., but even finer. The natives obtain the fixed oil of the fruits by expression after having crushed the pericarp and subjected them to a process of fermentation. The second species, known as

Moltradrago, was at first believed to be derived, either from *Myristica chapeliere* (*Malutchia chapelieri*, Warb.), or from *Myristica acuminata*, Lam. Closer examination, however, demonstrated that it had to be con-

* E. M. Holmes (see Proceedings, 1889, 438), describes three kinds of "Massoi Bark," two of them derived from the two species of *Cinnamomum* mentioned, the third from *Sasafras gœsianum*, which is considered to be the true "Massoi Bark."—Rep.

sidered as a new species of *Brochoneura*, which the author has named *B. dardaini*. The fruit is in many respects different from that previously considered, but the aroma of the seeds and of the arillus resembles that of voapary fruits very closely. The natives prepare the fixed oil from these fruits in the same way as that from voapary fruits, both being used for greasing the hair and medicinally for the treatment of the itch.—Pharm. Ztg., liv (1909), No. 20, 201 ; from Rép. de Pharm., 1909, No. 2.

Nutmeg—Chemical Examination and Physiological Action.—Frederick B. Power and Arthur H. Salway, in continuation of previous experiments on the constituents of nutmegs, and particularly of those of the volatile oil (see Proceedings, 1908, 332), have made a comprehensive chemical examination of the "press-cake" resulting from the preparation of the "expressed oil of nutmeg." The "press-cake," after being finely powdered, was extracted successively in a Soxhlet apparatus with (*A*) light petroleum (b. p. 30°–40° C.), and (*B*) alcohol, and the constituents in each fraction determined by methods described in detail. The results of this investigation demonstrated that the only constituents of the petroleum and alcohol extracts from the "press-cake" of nutmeg which had not previously been identified in either the volatile oil or the expressed oil were the following: sugar, tannic acid and coloring-matter, resins, and a very small amount of a crystalline alcohol, ipuranol, $C_{23}H_{38}O_2(OH)_2$. In order to obtain confirmation of the statements which have previously been recorded that the narcotic effects produced by nutmeg are due to the essential oil or the myristicin contained therein, and also to ascertain whether any of the other products obtained in the course of this investigation possessed physiological activity, a considerable number of tests were conducted for the authors by Dr. H. H. Dale. From the results, which are described in some detail, there would appear to be no doubt that the narcotic property of nutmeg is correctly attributed to myristicin, $C_{11}H_{12}O_3$, and it may be assumed that the latter substance when associated with the other constituents of the nutmeg is in a condition much more favorable for absorption than when in a pure state. As in the case of many other narcotics, the lower animals are much less sensitive than man to the direct action of nutmeg on the cerebral functions.—Amer. Journ. Pharm., Dec., 1908, 563–580.

Bombay and Macassar Mace—Use as Adulterants of Banda Mace and Characters of Distinction.—E. M. Holmes, in view of the apparent use of Bombay and Macassar mace for adulterating Banda or true mace, points out the diagnostic characters by which the three kinds of mace may be distinguished from each other under the microscope, which, accompanied by illustrations, must be consulted in the original. He also gives a description of their distinctive pharmacognostic characters, which may serve well for the recognition of the three varieties of mace as they appear in commerce.

Genuine or Banda Mace, the arillus of the fruit of *Myristica fragrans*, Houtt, as met with in commerce is usually flattened, about 1½ to 1¾ inches long and ¾ to 1 inch broad, the forked segments having rounded axils, and usually folded over into a kind of cap at the apex, and having a dull surface and a characteristic flavor like, but distinct from, that of nutmeg, and very little acridity. When broken across and examined with a platyscopic lens the broken surface appears oily but uniform, the oil-cells being not easily distinguished.

Bombay Mace, from *Myristica malabarica*, Lam., as met with in commerce, is longer, not flattened, of a deep reddish-brown color, about 2½ inches long and ¾ to 1 inch broad, with a polished surface, and has numerous divisions, mostly with extremely narrow axils, and more forked at the apex, where the ends of the segments are more loosely twisted into an apical cap. It has a sweetish taste, somewhat mucilaginous, and a very faint flavor with scarcely any pungency. When broken, the transverse surface shows under a platyscopic lens, on the inner edge, a projecting, slightly transparent membrane, and the oil-cells are distinctly recognizable as dark-reddish points forming an irregular ring near the surface.

Macassar Mace, from *Myristica argentea*, Wall., occurs in more or less broken pieces of a brownish color and a dull, opaque, often whitish powdery surface. The segments have very broad, rounded axils, and are few in number, widely separated, and usually about a quarter of an inch or more broad at the upper end of the segments, which are so compressed into the apical cap that it is not easy to distinguish the overlapping edges. The flavor resembles that of the true nutmeg, but has more of a sassafras tendency, and is distinctly acrid, by which alone it could be recognized when tasted. The transverse surface is oily, like that of true mace, but the oil-cells are distinguishable in a good light, being apparently larger than those of *M. fragrans*. The author's paper is concluded with a brief review of the methods of detecting adulterations of mace that have been proposed by different authorities on the subject.—Pharm. Journ., Nov. 21, 1908, 652–653.

Nutmegs—Commercial Varieties.—E. M. Holmes contributes an interesting description of the commercial sorts of nutmegs, embracing the Banda or true nutmeg (*Myristica fragrans*, Houtt.); the wild, Papua, Macassar, or long nutmeg (*Myristica argentea*, Warb.); the false nutmeg (*Myristica fatua*, Houtt.); and the Bombay nutmeg (*Myristica malabarica*, Lam.). The paper, which must be consulted in the original, is accompanied by excellent cuts, illustrating the three last mentioned varieties.—Pharm. Journ., March 27 and April 3, 1909, pp. 419–420 and 459–461.

SCROPHULARIACEÆ.

Digitalis—Physiological Standardization.—Drs. C. W. Edmunds and Worth Hale are of the opinion, based on a careful study of the physiological standardization of preparations of digitalis, that the determination of the minimum lethal dose upon the higher animals does not afford a safe standard of strength, because one preparation might be weak in its action upon the heart, and yet contain decomposition products whose typical action is upon the medulla. Such a preparation, when judged by this standard, would appear to be unduly strong. Whatever method is adopted should be as simple as possible, and it is important that the action upon the circulation should be taken as a standard of comparison in preference to the action upon the nervous system. The paper contains a description of the results obtained with various preparations of digitalis on the American market, and of the various methods of standarization that have been suggested.—Pharm. Journ., June 5, 1909, 768; from Bull. No. 48, Hygienic Laboratory, U. S. Public Health and M. H. Service.

SOLANACEÆ.

Atropa Belladonna—Cultivation.—Mr. John A. Borneman communicates a practical paper on the cultivation of *Atropa belladonna* in Philadelphia, which he finds to be both interesting and profitable. It is the easiest of all the medicinal plants, usually imported, to cultivate, and if a market could be found for the domestic drug, it would pay very well to cultivate it on a large scale. Among other plants which the author has under cultivation he mentions: Hyoscyamus, matricaria, pulsatilla, conium, triticum, calendula, passiflora, hydrastis, inula, digitalis, absinthium, arnica and echinacea.—Amer. Journ. Pharm., Jan., 1909, 1–5.

Belladonna—Cultivation Experiments in New Jersey and California.—Something like ten years ago Johnson & Johnson began the cultivation of belladonna at New Brunswick, N. J. on an extensive scale. The result of these cultivations was to demonstrate the fact that belladonna could be successfully cultivated in America on an extensive scale. That belladonna could be produced equaling, and, in fact, considerably exceeding, in the amount of alkaloid, the belladonna of the market. The work also brought out the fact that in its cultivation the chemical, physiological and therapeutic qualities of belladonna could be greatly increased in value. That by improving the methods usually employed for the preparation and preservation of the plant, there could be secured a better conservation of the medicinal constituents of belladonna, with the assurance of a more uniform product.

The only drawback to the cultivation of belladonna at New Brunswick was the climate. It was found that it was impossible to obtain more than one season's growth; in other words, the plants were winter-killed, and owing to the prevalent frost in the early spring and in the fall it became

necessary to start the plants in the green-house and transfer them to the open field. Accordingly, attempts were made simultaneously with the main cultivation to attempt the propagation of plants in the milder climates of the United States. Attempts made in several of our Southern States were not successful, largely due to the lack of rainfall, soil and other conditions. During the last four years, in connection with Professor Schneider, cultivation experiments have been carried on in California. It was found that in some parts of the state, especially in the latitude of San Francisco, the plant would make a full growth, the occasional spring frosts not affecting the young shoots, and the plant could remain in the ground throughout the year. The following are some of the results obtained at Salinas, California: Seed sown in January; germination slow. Season of rainfall was excessive, the soil becoming heavily packed, which interfered with the growth. In June specimen plants taken up weighed one pound —assay of entire plant 0.217 per cent. alkaloid. Plants grown at San Francisco Garden of Medicinal Plants, in rich sandy soil, being watered by hose along with other garden plants, after four years' growth, weighed one and one-quarter pounds dry, and gave the following assays: Leaves, 0.474 per cent.; root, 0.54 per cent.; stem, 0.27 per cent.

As a result of these experimental plantings a plot of forty-two acres was secured in Salinas Valley, and has been placed under cultivation, in charge of Professor Schneider.—Nat. Drugg., Aug., 1908, 259.

Belladonna Root—Alkaloidal Assay.—Owing to a variation between the results of certain shipments of belladonna root, obtained by W. A. Pearson and J. G. Roberts on the one side, and those obtained by Dr. Carl Enoch, of Hamburg, Germany, the latter having critically examined and compared the method employed by Pearson and Roberts, has communicated to them in great detail the method employed by him, which, it appears, is a modification of Keller's process. The authors have found that Dr. Enoch's method gives results that can be duplicated easily, and that it has the great advantage of being quickly carried out. Nevertheless, the authors find it expedient to use the U. S. P. method with slight modification, which simplifies the operation and increases the accuracy. The detailed account of both methods must be consulted in the original in Amer. Journ. Pharm., Aug., 1908, 368–373.

Belladonna and Scopola.—Some of the distinguishing morphological characters of these two drugs are described by Henry Kraemer in the "Proceedings" of this Association, 1908, 819–824.

Capsicum—Detection in Preparations of Ginger.—Chas. H. LaWall proposes as reliable a method for the detection of capsicum in ginger ale and other preparations of ginger, which is an adaptation of the method published by Garnett and Green in the "British and Colonial Druggist" in 1907. The preparation, if alcoholic, is heated to drive off the alcohol,

then slightly acidulated with dilute H_2SO_4, shaken after cooling with a small quantity of ether, the ether solution decanted, evaporated, and the residue weighed. If the residue weighs 10 Mgm. or less, it is dissolved in 2 Cc. of $\frac{N}{10}$ alcoholic potassium hydroxide, using 1 Cc. additional for each 10 Mgm. or fraction thereof in excess, and the alkaline solution is boiled for half an hour in a small test-tube fitted with a glass tube 1 M. in length to serve as a reflux condenser. This is then removed, the alcohol is evaporated, the test-tube is half-filled with water, followed by one-half the volume of ether, and the mixture thoroughly shaken. The ether solution is drawn off by means of a pipette, transferred to a watch-glass and evaporated spontaneously. Then *taste* the residue on the watch-glass. Capsicum is indicated by a sharp pungency as soon as the tip of the tongue touches the residue. When large quantities of ginger are used a slight camphoraceous taste is observed, but there is never any pungency unless capsicum is present.—Amer. Jour. Pharm., May, 1909, 218–219.

Hyoscyamus Muticus, L.—*Microscopic Characters of Distinction.*—Hanausek finds that the leaves of *Hyoscyamus muticus*, L., are easily and quickly distinguished from the official drug by their microscopic examination. While the leaves of *Hyoscyamus niger* exhibit only unbranched hairs, those of *H. muticus* also contain numerous forked, more rarely three or more branched, trichomes. The cells of the outer cuticle of both sides of the leaf of *H. muticus* exhibit a somewhat wavy outline and have strongly thickened outer walls. The fissure-openings are very numerous, as are also the crystals, which form prisms of various size. For comparison, the leaves of *H. albus* were also subjected to examination, which demonstrated that these leaves also contain only unbranched trichomes.—Pharm. Ztg., liv (1909), No. 29, 289; from Pharm. Post, 1909, No. 26.

Hyoscyamus Muticus—Histology and Diagnostic Distinction from Hyoscyamus Niger.—Charles M. Sterling comprehensively describes the histological characters of the stem, leaves, calyx and fruit of *Hyoscyamus muticus*, illustrated by excellent cuts, which demonstrate the existence of characteristics that cannot fail to distinguish this drug from the official *Hyoscyamus niger*. The much lighter and yellowish color of *H. muticus;* the larger and more conspicuous stem remnants and calyces furnish diagnostic characters, which even to the unaided eye are reliable means of identification. A microscopical examination, however, shows even more striking diagnostic characters. The trichomes of *H. muticus* stand out as the most prominent and reliable character that distinguishes the two species. But other characters almost as important are found in the epidermal cells of both leaves and calyces, the wood fibers, the crystals, the large parenchyma cells of the cortex, and the very conspicuous cells of the testa.—Amer. Journ. Pharm., Aug., 1908, 361–368.

Henbane, Stramonium and Scopolia—Constituents of Plants Cultivated

in Japan.—Matajiro Watanabe, at the recent International Congress of Applied Chemistry (London, May, 1909), reported the results of examination of several solanaceous plants cultivated in Japan. The leaves and fruits of henbane and stramonium extracted with alcohol were found to yield scopolamine and a minute quantity of hyoscyamine, the former occurring mainly in the fruits. From the seeds of plants considered to be *Datura alba*, hyoscyamine and a small quantity of atropine were said some years ago to have been isolated, but the author thinks that the plant was not *D. alba*, but *D. stramonium*, whose chief alkaloid is known to be hyoscyamine, and his results showed the presence of 0.1 per cent. of that alkaloid. From the herb of *Scopolia japonica* the author extracted alkaloidal principles, the elementary analysis of which gave results agreeing fairly well with the formulæ for hyoscyamine and scopolamine respectively, the former being present to the extent of about 90 per cent., the scopolamine about 5 per cent., and a minute quantity of atropine.—Pharm. Journ., June 5, 1909, 770.

Scopola—Distinction Between the European and Japanese Drug.—Scopola root having been admitted both in the United States and Japanese Pharmacopœias, Dr. G. Weigel calls attention to the fact that the U. S. P. drug is derived from *Scopola carniolica*, Jacq., a plant indigenous to Europe, growing in the eastern Alpine region, the Carpathian mountains, and the adjacent territories, whereas the drug official in Japan is derived from *Scopola japonica*, Maxim., a plant growing both in China and Japan While the activity of the two drugs is dependent on the same principles, namely, atropine, hyoscyamine and hyoscine, the rhizomes of the European plant, *Scopola carniolica*, are the more potent of the two, containing from 0.4 to 0.5 per cent. of total alkaloid, whereas the Japanese drug contains only about one-half as much. The author gives a concise description of the principal pharmacognostic characters and distinctions of the two drugs.—Pharm. Zentralh., xlix (1908), No. 45, 915–916.

Solanum Sodomaeum—Medicinal Use in South Africa.—C. E. Oliver briefly describes (with an illustration) a common weed growing on cultivated ground in South Africa, which is known by the Kaffir name of "um-Tuma," and is botanically *Solanum sodomaeum*. The whole plant, which may grow to a height of 5 or 6 feet, is well armed with spines, the leaves are divided, and the flowers typical of the order *Solanaceæ*, being whitish or purple with a yellow central column of joined anthers. The parts used medicinally are the fruit (apple of Sodom), which, when ripe, is a large pale yellow berry, averaging an inch in diameter, and the leaves. The drug is for destroying parasites, and is employed for itch, ringworm, etc., and was formerly used for scab in sheep. The juice of the fruit is extremely acrid and bitter, and a drop squirted accidentally into the eye caused great pain and inflammation, but did not produce dilation of the

pupil. The juice contains solanine.—Chem. and Drugg., Aug. 22, 1908, 325.

OLEACEÆ.

Olive Oil—Present Supply Practically True to Label.—C. R. Noyes, who has made an elaborate inquiry into the conditions under which the market is supplied with olive oil, says: "It seems to be a tradition in the drug trade that all olive oil, 'pure,' 'genuine,' or whatever other attractive title it bears, is, as a matter of fact, never 'pure,' 'genuine,' etc., but a compound of various cheap adulterants or spurious imitations. This attitude of suspicion has been so long justified by the demoralized condition of the market that it may be some time before it becomes generally recognized that for the most part the present olive oils are true to label. Substitutes are now labeled 'salad oil,' and sophistications are limited by the stringent regulations of both Federal and State inspection to a constricted and somewhat hazardous traffic." "Whatever adulteration is being carried on at the present time is certainly done on a small scale, and it is quite safe to assume that the generality of olive oil offered varies only in quality and not in composition."—Proc. Penna. Pharm. Assoc., 1908, 282–284.

Olive Oil—Adulterations Observed in Alabama.—Emerson R. Miller publishes the results of examination of thirty samples of olive oil by the Halphen, the nitric acid and the silver nitrate tests. Six of the samples were evidently nothing but cotton-seed oil, and five others contained the same oil as adulterant. In an experience of a number of years, during which examinations of olive oil in the open market were made by the author, from 20 to 36 per cent. of the number examined were similarly adulterated.—Proc. Ala. Pharm. Assoc., 1908, 71–73.

Olive Oil—Detection of Foreign Oils.—An anonymous writer recommends the following little known test for the detection of foreign (arachis and sesame) oils in olive oil: If the adulterated oil is mixed with an equal volume each of nitric acid and of a 0.1 per cent. ethereal phloroglucin solution and shaken, a raspberry-red color is developed in the ethereal oily layer, but fails completely in the case of pure olive oil.—Pharm. Ztg., liv (1909), No. 11, 106.

Olive Oil—Phloroglycin-Nitric Acid (= Kreis's) *Test not Available for Foreign Oils.*—Having opportunity to test a large variety of commercial brands of olive oils, from the finest to the most ordinary, F. Dietze applied to them the test recommended in the preceding abstract (which, by the way, is known as "Kreis's Test"), and was astonished to find that none of the samples failed to give the raspberry-red reaction which is supposed to fail with pure olive oil. Specimens of olive oil of guaranteed purity were then obtained by correspondence with reliable French and Italian houses, but these without exception also gave the reaction. He

then obtained a quantity of olives from a friend in Italy, which yielded about 20 per cent. of light yellow and agreeably tasting oil to cold expression. This incontestably genuine olive oil exhibited the following constants and reaction: Sp. gr. at 15°, 0.914; iodine number, 82.3; saponification number, 193.2; congealing point, beginning at—13.5° and complete at—17°. On mixing 2 Cc. of this oil with 2 Cc. of phloroglucin solution (1 per cent. in ether, Rep.) and 2 Cc. of nitric acid of sp. gr. 1.4, an immediate and distinct *rose color* is developed, changing in a few seconds to *light raspberry-red* and paling again after a short time. Applying the same test to other fixed oils, the author observed the following color reactions:

Immediate raspberry-red: Arachis-, almond-, poppy- and colza-oils

Carmine-red: Linseed-, peachkernel- and benne-oils.

Light violet-red, quickly paling: Ricinus-oil.

Pure olive oil to which 10 per cent. of arachis oil or bene oil had been added gave the same reaction as the pure oil; but with an addition of 20 per cent., the color reaction was somewhat deeper. Obviously, Kreis's reaction is not available for the detection of foreign oils in olive oil.—Pharm. Ztg., liv (1909), No. 26, 260.

LABIATÆ.

Lamium Album—Stachyose a Constituent.—Piault has isolated from the subterranean portions of *Lamium album* a sugar which proved to be identical with "stachyose" (manna-tetrasaccharose), the sugar found by Schulze and v. Planta in the tubers of *Stachys tubiflora*. The author also determined the presence of a glucoside hydrolizable by emulsin.—Pharm. Ztg., liv (1909), No. 19, 187; from Journ. de Pharm. et Chim., 1909, No. 5.

Lavender—Cultivation in the South of France.—The "Revue de Grasse" (*51* [1908], Nos. 28 and 32) directs attention to the efforts being made to stimulate the interest in the lavender cultivation in the south of France, and refers with great enthusiasm to a pamphlet published by L. Lamothe, which aims at keeping alive and stimulating this interest, and of which a second edition (1908) has just appeared. Quoting from this at some length, Schimmel's Report mentions that Lamothe gives an exact botanical description of the individual *Lavandula* species, discusses the conditions which are most favorable for the existence of lavender, the nature and reatment of the soil for laying out the plantations and the manner of doing so; furthermore, the yield of oil and the profit to be obtained. The yields of oil are, according to Lamothe, under ordinary conditions, 0.69 per cent., in dry years, 1 per cent.; but these figures are said to be more favorable for the artificial lavender plantations, which show a yield of at least 0.8 per cent. For the more important particulars, the original abstract may be consulted in Schimmel's Rep., Nov., 1908, 76–79.

Micromeria Chamissonis, Greene—Products of Steam Distillation.—F. B. Power and A. H. Salway have submitted "Yerba Buena" (*Micromeria chamissonis*, Greene: syn. *M. Douglassi*, Benth.), of unobjectionable origin, to examination. The dried herb yielded 0.16 per cent. volatile oil on distillation with steam, and, towards the end of a distillation, a semi-solid substance which proved to be palmitic acid (m. p. 61.5° C.) The pale yellowish-brown oil had a pleasant aromatic odor, somewhat like peppermint, and gave the following constants: sp. gr. at 20° C., 0.9244; optical rotation, —22° 48′; not completely soluble in 10 vol. 70 per cent. alcohol. From the extract prepared with hot alcohol, about 0.5 per cent. of a volatile oil of the same appearance and odor was obtained by steam distillation. This had the following constants: sp. gr. at 20°, 0.9450; opt. rotation, —26° 44′; readily soluble in 70 per cent. alcohol. The aqueous portion of the distillate contained formic, acetic and butyric acids.—Schimmel's Rep., Nov., 1908, 86; from Journ. Amer. Chem. Soc., *30* (1908), 251.

CONVOLVULACEÆ.

Jalap—Chemical Examination.—Dr. Frederick B. Power and Harold Rogerson communicate the results of two years' work on the chemical study of the constituents of jalap, which render it evident that many of the conclusions which have previously been recorded respecting the composition of jalap resin and various amorphous products obtained therefrom are erroneous. It would be quite fallacious to assign to the so-called "convolvulin" any empirical formula whatsoever, inasmuch as by successive extraction with solvents, such as chloroform, ethyl acetate and alcohol, it may be further resolved into several products, all of which, moreover, are amorphous and of indefinite composition. Similar conditions exist with regard to the character of the amorphous products obtained by the alkaline hydrolysis of the resin, such as the so-called "purgic" and "convolvulic" acids, to which definite formulæ have likewise been assigned. Both of the last-mentioned products are complex mixtures, some of the constituents of which are not even glucosidic. The authors show, for example, that the alcohol extract of the resin, when hydrolyzed by baryta, yields a product which, like the original resin, is capable of being further resolved when successively extracted with ether, chloroform, ethyl acetate and alcohol. The last-mentioned alcoholic extract, when heated with dilute sulphuric acid, affords, moreover, not only sugar and convolvulinolic acid, $C_{15}H_{30}O_3$, as indicated by Hoehnel in the case of a less completely purified product, but also ipurolic acid, $C_{14}H_{28}O_4$, and several volatile acids, while a portion of it apparently remains unchanged. It is thus obvious that the "convolvulic acid" of Hoehnel cannot be regarded as an individual substance. It was deemed desirable to subject the resin to a more complete examination, and the results are embodied in the paper.

The following are the constituents of definite character or composition which the authors have isolated :

Essential oil, sp. gr. 0.886 at 20° / 20°, optically inactive.

Sugar, which yielded d-phenylglucosazone, m. p. 217°–218°.

Resin, 9.4 per cent., which yielded with (1) petroleum ether, 1.9 per cent. extract containing—

Palmitic and stearic acids (free), formic, butyric and higher volatile acids, palmitic acid and unsaturated acids, chiefly linalic (combined).

Phytosterol, cetyl alcohol and $C_{18}H_{36}O$.

(2) Ether extract (9.7 per cent.) consisting of ipurganol, $C_{21}H_{32}O_2(OH)_2$, m. p. 222°–225° ; (3) chloroform, extract (24.1 per cent.), containing β-methylæsculetin, $C_9H_5(CH_3)O_4$, and after treatment with alkali and sulphuric acid, formic, butyric and d-methylethylacetic acids and convolvulinic acid, $C_{15}H_{30}O_3$; (4) ethyl acetate extract (22 per cent.), the same acids as in 3 and a higher homologue of the last—$C_{17}H_{34}O_3$; (5) alcohol extract (38.8 per cent.) yielded on treatment the acids before mentioned, besides azelaic, sebacic and valeric acids.

The five extracts were physiologically tested by Dr. H. H. Dale, of the Wellcome Physiological Research Laboratories, 1 Gm. of each being administered to dogs, with the following results :

I. The petroleum extract had no effect.

II. The ether extract produced prompt, but not severe, purgation.

III. The chloroform extract caused repeated purgation, lasting for forty-eight hours.

IV. The ethyl acetate extract was similar in its action to the chloroform extract, the purgation lasting twenty-four hours.

V. The alcohol extract produced repeated and powerful purgation.

Apart from the purgative action of the various extracts no effect was observed, all the animals having remained perfectly well.—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem. & Drugg., June 5, 1909, 884.

Jalap—New Process of Assay.—Professor Wilbur L. Scoville has made an experimental study of the U. S. P. method of determining the percentage of resin in jalap. He finds it to extract only 82 per cent. of the resin. and that still lower results are obtained by resorting to precipitation with water. His results are summarized as follows :

1. The U. S. P. method takes out only about 85 per cent. of the resin present.

2. The use of second or third portions of chloroform in the U. S. P. process does not extract any more resin.

3. Precipitation in water gives still lower and more variable results.

4. The use of a concentrated solution of potassium citrate in place of the water in the U. S. P. process gives an increased yield of resin—about 95 per cent. of the resin present.

5. A mixture of 20 Cc. of alcoholic tincture of jalap, 10 Cc. of chloroform (instead of 20 Cc.), and 20 Cc. of concentrated solution of potassium citrate extracts about 98 per cent. of the resin present, and the amount of citrate dissolved by the chloroform-alcohol solution almost exactly offsets the resin lost. The results without correction is thus 99 + per cent.

6. The solution of potassium citrate holds back the water-soluble bodies in the alcoholic tincture as well as water, and the mixture does not emulsify.

7. The following process is therefore recommended as giving more accurate results than the U. S. P. method:

A fresh portion of 10 grammes of powdered jalap is percolated with U. S. P. alcohol in a cylindrical percolator, until 100 Cc. of tincture are obtained. Twenty Cc. of this tincture are mixed in a separator with 10 Cc. of chloroform, and then 20 Cc. of a concentrated solution of potassium citrate are added.

Now shake the mixture well and set aside until the solutions have separated and each has become perfectly clear. Then draw off the lower layer, and pour the upper solution out of the separator. Rinse the separator with 4 Cc. of alcohol and 2 Cc. of chloroform, and add to the first decantation. Evaporate at a gentle heat, dry at 100° C., and weigh.

For a fluidextract mix 2 Cc. with 18 Cc. of alcohol and treat as above.

If an estimation of the ether-soluble resin is desired, redissolve the resin in 5 Cc. of alcohol, add enough sawdust (free from resin) to absorb the liquid, and dry at 100° C. Extract this sawdust with ether, and evaporate the ethereal solution. Dry at 100° C. and weigh.—Bull. Pharm., May, 1909, 194–195.

Ipomœa Fistulosa—Chemical Examination.—In an "Inaug. Dissert." (Kaiser-Wilhelms Universität, Strassburg, 1908), P. Haase gives the details of a chemical examination of the roots, stems, and seeds of *Ipomœa fistulosa*, a native of tropical South America, where it is one of several species known as "wild cotton," or "algadão bravo." The roots and stems contain 0.2 per cent. of jalapin (orizabin), wax, a hexose, and a tannin. The seeds also contain a disaccharide, probably cane sugar, and an oil consisting of the glycerides of oleic, palmitic, and stearic acids, and containing a volatile acid, phytosterin lethicin, as well as the glucosidal substance and tannin found in the root and stem.—Pharm. Journ., May 8, 1909, 611.

Fictitious Scammony—Occurrence in French Commerce.—J. Warin calls attention to a fictitious scammony occurring in French commerce, which is prepared from scammony resin instead of the juice of the plant. It occurs in brownish cakes less dense than the genuine drug, with a duller and more porous fracture. It softens under the teeth; when rolled between the fingers, and warmed by breathing on it, it forms an elastic

ductile pill. True scammony is gritty under the teeth, and does not easily roll in the fingers as above; the pill formed is friable. The oder of the false scammony is peculiar, recalling that of resin and cooked plums; its powder is lighter and yellowish-grey instead of blackish-grey, and its appearance in emulsion with water is different. The filtered aqueous decoction does not show the fugitive red color given by that from true scammony with tincture of iodine. The alcoholic solution of the resin gives a marked red color reaction, which is not obtained with scammony. When the powder is thrown into oil of turpentine it forms fibrous flocks, which sink and aggregate at the bottom of the liquid. Natural scammony powder remains in grains in turpentine oil, and sinks without aggregating.—Pharm. Journ., June 26, 1909, 862; from Journ. de Pharm. et Chim., *29* (1909), 521.

GENTIANACEÆ.

Powdered Gentian — Preliminary Examination of the Commercial Article.—In view of the frequent adulteration of powdered gentian root, as found on the English market, E. Wightman Bell recommends the following simple preliminary test, which is based on the copious absorption of water by gentian root in contrast with the inferior absorptive power of the adulterants (powdered olive stones, etc.), commonly used: Place 5 fl. ozs. of water in a 6-ounce graduated bottle, add ¼ oz. of the powdered gentian, and shake well occasionally for a day or two. Genuine gentian will sink slowly to the bottom of the bottle, and after standing a short time, after shaking should reach the 2½ to 3 oz. graduation, whilst in the case of adulterated samples the deposit of sediment is more rapid and will measure much less—in a recorded experiment, from ¾ to 1¼ fl. ozs.—Pharm. Journ., Aug. 29, 1908, 255.

APOCYNACEÆ.

Apocynum Cannabinum—Toxic Constituent: Cynotoxin.—In continuation of his studies on the constituents of Canadian hemp (see *Apocynin* under "Organic Chemistry"), Horace Finnemore finds that the alcoholic extract of the commercial root of *Apocynum cannabinum* yields on extraction with chloroform, after removing the apocynin with ether, a relatively small quantity of an active substance, producing symptoms identical with those caused by the drug itself, which he has named

Cynotoxin.—This has the composition $C_{20}H_{28}O_6$, and is a well-defined, colorless substance, which crystallizes in small, apparently rhombic pyramids, and melts and decomposes at about 165° C. It is sparingly soluble in water and the usual organic solvents, and extremely bitter in taste. Pharmacological investigation by Mr. P. P. Laidlaw, M. B., has shown that it is an extremely potent drug of the digitalis class, and that the pharmacological properties of apocynin (acetovanillone, *loc. cit.*) are neglible.

The chemical and pharmacological properties of cynotoxin are still under investigation ; it is already evident, however, that it is a dilactone, either of Kiliani's digitic acid, $C_{20}H_{32}O_8$ (Ber., 1891, 24, 339), or of a closely related isomeride.—Pharm. Journ. March 20, 1909, 394 ; from Proc. Chem. Soc., March 12, 1909, 77.

Chlorocodon Whitei, Hook. fil—A Possible Adulterant of Senega.—Mueller directs attention to the root of *Chlorocodon Whitei*, Hook. fil., a plant growing in Natal, which is interesting both from the pharmacognostic and pharmacologic stand-point. It is known by the natives under the names of " mundi- ", " mindi-" and umundi " root, and is used by them as a stomachic and tonic remedy. In the early eighties of the last century this drug made its appearance on the English market being offered as " senega root," and it is conjectured that it may be employed as an adulterant of the latter drug, although the root only remotely resembles true senega.—Pharm. Ztg., lii (1908), No. 55, 546 ; from Pharm. Post, 1908, No. 47.

Condurango Bark—Chemical Investigation.—Dr. Konrad Kubler has made a chemical investigation of the constituents of condurango bark (*Marsdenia condurango*) with particular consideration to the study of the glucosidal constituent.

Condurangin.—By a circumstantial method described in detail this was obtained in a pure condition suitable for elementary analysis, this degree of purity being assured when the glucoside remained unchanged at a temperature of 146°–147° C. in a capillary tube. Condurangin in the purest form obtainable is an amorphous, light yellow, tolerably hygroscopic powder, soluble in chloroform, in acetone, in water and in alcohol, insoluble in ether and in benzene. Its aqueous solution has a pure bitter taste and froths strongly when shaken, has an acid reaction and is optically inactive even in highly concentrated solution. It has no definite melting-point ; has the composition $C_{40}H_{60}O_{16}$, and apparently contains two methoxyl groups. On hydrolysis it yielded one molecule of sugar, but no other single hydrolytic product. The presence of cinnamic acid in the products resulting from further reduction, leads the author to infer that condurangin represents an ester-like, probably high molecular cinnamic acid derivate combined with sugar. The author succeeded in isolating a second, hitherto unknown body, which he has named

Condurit.—This has the composition $C_6H_{10}O_4$, and is evidently a polyatomic alcohol, containing 4 hydroxyl groups, similar in the cylic arrangement of its carbon atoms to quercite and inorite, but differing from these in being unsaturated. Condurit crystallizes readily from hot alcohol in large double oblique four-sided prisms, is very readily soluble in water, somewhat less soluble in acetone, sparingly soluble in alsolute alcohol, and insoluble in the other carbon solvents. The watery solution has a pure

and intensely sweet taste, is neutral in reaction, and optically inactive. By the action of hydrochloric acid condurit is split up into pyrocatechin and water, according to the following equation: $C_6H_{10}O_4 - 2H_2O = C_6H_4(OH)_2$. The

Volatile Oil of Condurango was obtained to the amount of 0.3 per cent. of the bark. It had the sp. gr. 0.9741; optical rotation $(a)_D = +6.724°$; boiling-point, 140° C. By shaking out with a 3 per cent solution of NaOH, an acid portion and a neutral portion were obtained. The neutral portion amounted to 30 per cent. of the crude oil, had an agreeable aromatic odor, the sp. gr. 0.9270, optical rotation $(a)_D = +19.56°$ and boiling-point, 225° C. The acid portion consisted of a mixture of high-molecular fatty acids and congealed to a solid crystalline mass when freed from the solvent. Arch. d. Pharm., *246* (1908, No. 8 and 9, 620–659.

Kawar Root—A Reputed Cancer Remedy from the Transvaal.—While engaged in the chemical investigation of condurango bark, the attention of Böhm was directed to "kawar root," a drug which has the popular reputation in the Transvaal of being a reliable remedy for cancer. Like condurango bark, which was also originally introduced into Europe as a cancer remedy, the drug is derived from an *Apocynacea;* but it is remarkable that the proximate constituents of kawar root should be essentially the same as those of condurango bark. Besides an abundance of a glucoside,

Kawarin, which is closely related to condurangin and like this exhibits the peculiarity that its clear aqueous solution becomes decidedly turbid on heating, kawar root contains considerable quantities of a volatile oil, having a pronounced but not unpleasant odor which also resembles that from condurango. It is significant that two distinct drugs, indigenous to widely separated continents, should be esteemed in their respective localities as vulnerary remedies for the same diseases, and prove on investigation to show a close analogy in their proximate constituents.—Pharm. Ztg., liii (1908), No. 73, 613; from Münch. Med. Wschr., 1908, No. 34.

Kawar Root—Constituents.—R. Boehm and K. Kubler give an account of the chemical investigation of kawar root, which apparently forms the basis of the above description of the chemical constituents of this new drug.—See Arch. d. Pharm., *246* (1908), No. 9, 663–666.

Mouïndu (Muindu)—A New Drug from the Congo.—P. H. Marsden describes the microscopic characters of a new Congo drug, called "Mouïndu" or "Muindu" in the vernacular, and gives a microscopic description of the bark. In the wood, lacunæ characteristic of the genus *Strychnos* may be seen, but no conclusive evidence of the alkaloid strychnine has been obtained. The bark has some resemblance to that of the false angostura bark (*Strychnos nux vomica*, Linn.), and has some-

thing in common with sassy bark (*Erythrophlœum guineense*, Don.) A tincture prepared from the bark of muindu by maceration in 60 per cent. alcohol, and 1 : 10 strength, tested on frogs, gave negative results. Although strychnine has not been isolated from the plant, on flooding a transverse section of the bark with sulphovanadic acid, the customary violet coloration due to strychnine was afforded, but this was not given by a similar section which had been well washed with an alcoholic solution of tartaric acid previous to irrigation with sulphovanadic acid.—Pharm. Journ., June 26, 1909, 862 ; from Annals of Trop. Med. and Parasitology II, No. 5, May, 1909.

Nerium Oleander—Fixed Oil of the Seeds.—Camo obtained from the seeds of *Nerium oleander* about 16 per cent. of a dense, brown fixed oil having an acid taste and exhibiting the following constants : Koettsdorfer number, 202–203 ; Reichert-Meissl. number, 10.26 ; Hübl iodine number, 88 ; acetyl number, 19 ; unsaponifiable portion (giving the phytosterin color reaction, but not a single body), 20 per cent. The author's results point to the presence of acids of low molecular value—*i. e.* soluble and volatile acids—and to the presence of a wax-like body.—Pharm. Ztg., liii (1908), No. 81, 797 ; from Bull. de Scien. Pharmacolog., 1908, No. 8.

Nux Vomica—Strychnine Standard for its Galenical Preparations.—In a previous paper R. Wright, in conjnnction with E. H. Farr (see Proceedings, 1907, 779), had suggested that although brucine was far less toxic than strychnine, nevertheless it was present in preparations of nux vomica in such proportions that in fixing a standard for these preparations its presence ought, if possible, to be taken into account and calculated for. Authorities quoted to the effect that the physiological action of brucine was in all respects similar to that of strychnine, although far less toxic, led to the further suggestion that in standardizing galenical preparations of nux vomica the brucine should be determined, and, by means of a proper factor, calculated into terms of strychnine and the strychnine standard modified by taking the brucine into account in this way. To settle the question of the relative toxicity of the two alkaloids, Mr. Wright supplied Dr. W. E. Dixon with carefully purified brucine who now reports the results of experiments carried out in conjunction with W. H. Harvey (see *Brucine* under "Organic Bases"), which have demonstrated that the difference between the physiological action of strychnine and brucine is so marked as to make it inadvisable to express the clinical value of one alkaloid in terms of the other. It follows that a *strychnine standard for nux vomica preparations is preferable to one of total alkaloid.*—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 496.

Assay of Nux Vomica and Preparations—Separation of Brucine from Strychnine.—In the U. S. P. assay of nux vomica and its preparations, nitric acid sp. gr. 142 and consequently stronger than the official acid is

directed for the destruction of the brucine by oxidation, and failure of accurate results is due to the use of the weaker official acid. A. B. Lyons says that the addition of a little sodium nitrate will obviate the use of the stronger acid, but that a simpler way to accomplish the desired object is to put the acid (1.5 Cc. of nitric acid, U. S. P.) into a test tube, add about 10 to 20 Mgm. of sugar, and heat gently until fumes are evolved, then add 1.5 Cc. of water, cool the mixture to room temperature, and add it to the solution of nux vomica alkaloids, which will instantly assume a deep red color. The assay is to be conducted in all other respects exactly as directed in the U. S. P., although there is advantage in using in place of pure chloroform a mixture of chloroform and ether (about 4 : 3 volume), as a solvent for the free strychnine.—Amer. Drugg., Mar. 14, 1909, 128.

Nux Vomica—Adulteration of the Powder with Olive Stones, etc.—Having detected the admixture of olive stones in a sample of powdered nux vomica, A. Juillett examined a number of samples of the powdered drug obtained from druggists and pharmacists, and found no less than 80 per cent. to be adulterated. Illustrations of the elements of the genuine and adulterated powder are given. One of these adulterated samples contained only 0.83 per cent. of total alkaloids, and consisted of a mixture of practically equal parts of nux vomica and olive stones. The adulteration is not wholly recent, it occurs in samples which have been in stock for seven or eight years. Commercial rasped nux vomica is not adulterated with olive stones. For this form of the drug raspings of vegetable ivory, the seeds of *Phytelephas macrocarpa*, is the admixture employed.—Pharm. Journ., June 5, 1909, 768; from Réport. de Pharm., 21 (1909) 148.

Strychnos vacacoura, Baill.—The botanical source of the so-called "bankanko" fruits. See *Bankankosin* under "Organic Chemistry."

Spigelia and Ruellia—Botanical and Microscopical Distinction.—William Mansfield publishes an interesting paper on the distinctive botanical and microscopical characters of the stems and rhizomes of *Spigelia marylandica* and of *Ruellia ciliosa*, the latter being in recent years frequently substituted for, or admixed with, the true pink root (see Proceedings, 1907, 776), as the author thinks rather from a lack of knowledge of the collectors and dealers than designedly. The text of this paper is illustrated with a number of handsome drawings and photogravures.—Drugg. Circ., March, 1909, 110–114.

Strophanthus Kombé—Natural Causes of Variation.—A writer under the signature "Dr. H." discusses the causes of variation in their reaction with sulphuric acid of the seeds supplied in commerce as being derived from *Strophanthus kombé*, and expresses the opinion that this variation is not due to differences in the botanical origin of the drug, but to the fact

that the plant may produce seeds which are rich or poor in strophanthin, as well as such containing no strophanthin at all. He points out that similar conditions prevail in other plants, as for example, in the case of bitter and sweet almonds. This variation of the kombé seed, however, has discredited the drug, and he is therefore inclined to the opinion originally expressed by Gilg (1900), that the G. Ph. should adopt the seeds of *Strophanthus hispidus* as the official drug, since these seeds uniformly yield the characteristic green color with sulphuric acid.—Schw. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 37, 586.

Strophanthus Kombé—Commercial Quality of the Drug.—Caesar and Loretz (September Report, 1908) declare that the kombé strophanthus seeds now on the market are of satisfactory quality.—Pharm. Ztg., liii 1908), No. 88, 815.

Strophanthus—Identical Value of the Kombé and Hispidus Seeds.—Hjalmar Modeen's investigations demonstrate that, on the basis of their strophanthin content, the pure and genuine seeds of *Strophanthus Kombé* and of *S. hispidus* are of identical value, but that the commercial sorts are frequently admixed or adulterated with the seeds of inferior species of *strophanthus*. The therapeutic identity of the strophanthins from the seeds of the two species, however, remains to be established.—Apoth. Ztg., xxiii (1908 , No. 67, 596.

Strophanthus Seeds—Sulphuric Acid Test.—An experimental review of the different methods proposed and in use for determining the satisfactory quality of official strophanthus seeds with particular reference to the sulphuric acid test, leads Fr. Schaub to recommend the use of sulphuric acid of approximately 75 per cent. as being both reliable, more convenient, and superior to the more concentrated acid. The test is carried out by moistening a section of the seed, from 0.1 to 0.5 Mm. in thickness, with the 75 per cent. sulphuric acid on a slide by the aid of a glass rod, and viewing the section under the lens. It is not necessary to determine the exact percentage of acid in the test liquid; it suffices to dilute 8 parts of concentrated sulphuric acid of sp. gr. 1.836–1.840 (= 94–98 per cent. with two parts of water, which yields an acid containing 75.2–78.4 per cent of absolute acid. A satisfactory reaction is obtainable even with an acid of 80 per cent. strength. The initial green color remains from 2 to 4 and, under circumstances, even 6 minutes, then changes to blue; whereas with the more concentrated acids the initial reaction in the same specimens is frequently obscured by brown, and if green, rapidly changes to brown or blue, according to the degree of concentration and the special character of the seed.—Apoth. Ztg., xxiii (1908), No. 102, 920–922.

Vincetoxicum Root—Constituents.—According to the investigations of previous authors, the glucosidal constituent of vincetoxicum root (*Vincetoxicum officinale*, Moench.), *vincetoxin*, is identical with condurangin.

Supplementary to his recent investigation of the constituents of condurango root (which see above), Dr. Konrad Kubler has extended his investigations also to the constituents of vincetoxicum root. Following the method of Tanret (see Proceedings, 1885, 344), he obtained a product which could be regarded only as impure vincetoxin, which, however, when further purified yielded the glucoside in a pure condition. So obtained,

Vincetoxin was a nearly colorless powder, remaining unchanged when heated in a capillary tube to 146° C., but was decomposed with evolution of gas at 182° C. It had a strong bitter taste and was readily soluble in water, alcohol and chloroform, but insoluble in ether. The aqueous 1 per cent. solution (neutral in reaction) showed an optical rotation of 1.5° to the left. In its general characters vincetoxin bears a certain resemblance to those of condurangin, from which it differs, however, in its composition ($C_{50}H_{82}O_{20}$), in being strongly lævogyre, whereas condurangin is optically inactive, and in not yielding cinnamic acid when the hydrolytic products, insoluble in water, were subjected to the action of alcoholic KOH. Furthermore, the alcoholic extract of vincetoxicum root does not contain a trace of a body resembling the new body, *condurit*, extracted by the author from condurango root. By suitable treatment with methyl alcohol, however, crystallized *saccharose*, amounting to 3 per cent. of the original drug, was isolated, while *glucose* was also determined as a constituent of the alcoholic extract.—Arch. d. Pharm., *246* (1908), No. 9, 659–663.

COMPOSITÆ.

Burdock—Cultivation in Texas.—It is somewhat singular that a common weed, such as burdock, should prove a profitable crop under cultivation, but J. Long, of Sherman, Texas, shows how this can be done, and that the quality of the cultivated drug is superior to that grown in the wild state. He has obtained from a single acre a yield of 2,200 pounds of dried roots, which sold at 8 cents per pound, and 400 pounds of leaves, which sold at 6 cents per pound.—Meyer Bros.' Drugg., Feb., 1909, 38.

"Chich."—Identification with Artemisia Herba-alba var. Densiflora.—Schimmel & Co., having received from Egypt an herb which is known there by the name of "Chich," submitted the sample to Prof. Heckel, of Marseilles, who regarded it provisionally as being an *Artemisia herba-alba*, and subsequently Dr. Giessler, of Leipzig, was able to ascertain that the sample represented a variety of this plant, namely,

Artemisia Herba-alba var. Densiflora Bois.—The plant occurs on the high limestone plateaus of Egypt and Tripoli and probably also Algeria, reaching its full development early in March, and flourishing particularly in rainy years. The Arabs and Tuaregs employ a decoction of the herb medicinally as an emollient and diuretic. The

Volatile Oil of "Chich" was obtained by water vapor in a yield of 1.6 per cent., of a yellowish color, and a distinct odor of thujone, with the following constants: Sp. gr. at 15° C., 0.9192; opt. rotation, $(a)_D = -5° 20'$; index of refraction at 20° C., 1.45611; acid number, 1.5; ester number, 11.0; ester number after acetylation, 40.7; soluble in 2.6 vol. and more of 70 per cent. alcohol.—Schimmel's Rep., April, 1909, 98.

Chicory—Unpleasant Gastric Disturbances following its Use as a Beverage.—Horwitz has studied the effects of chicory when consumed as a beverage, and has arrived at the conclusion that it is by no means entirely harmless. Although devoid of harmful effect upon the heart's action, it is liable to produce and aggravate gastric and intestinal disturbances. Moreover, the infusion is worthless as a stimulant and nutrient beverage, while both odor and taste are disagreeable.—Pharm. Ztg., liii (1908), No. 59, 583; from Ztschr. f. neuere physik. Med., 1908, No. 10.

Cnicus Benedictus, L.—*Anatomical Structure of the Different Parts of the Plant.*—L. Rosenthaler and P. Stadler communicate an elaborate paper in which they describe in great detail (illustrated by 75 drawings in 10 tables) the anatomical structure and morphological features of the different parts of *Cnicus benedictus*, L., viz.; the sprout; the leaf; the stem; the glands and hairs; the root; the flower; the fruit; and the secretory passages. The paper concludes with a monograph on "Herba Cardui benedicti," proposed (as a type) for inclusion in a new edition of the G. P.—Arch. d. Pharm., *246* (Sept., 1908), No. 6, 436–466.

Eupatorium Rabaudianum—Two Remarkable Sweet Constituents.—At the recent International Congress of Applied Chemistry, Dr. Karl Dietrich described two sweet principles isolated from *Eupatorium rabaudianum*, which he has named "Eupatorin" and "Rabaudin" respectively—the former being 150 times sweeter than sugar, the latter 180 times. Other constituents are an oil, resin, a bitter substance, and wax, the properties of each being briefly described.—Pharm. Journ., June 5, 1909, 769.

Eupatorium Rabaudianum — Investigation of Sweet Constituent.—Rasenack has investigated the sweet principle contained in a Paraguay compositæa, *Eupatorium rabaudianum*. He finds this sweet substance to pervade all parts of the plant, but in variable proportions—from 0.5 to 26 per cent.—being most abundant in the green leaves. It resembles the sweet principle of licorice in certain respects, but differs in some important characters. It forms white needles having a very sweet taste; is readily soluble in water, alcohol and amyl alcohol, but sparingly soluble in methyl alcohol and acetone, and soluble in traces only in ether, benzene and the other organic solvents. When heated in a capillary tube it remains unchanged up to about 180° C., conglomerates between 180° and 190° C., and turns yellowish; at a higher temperature it softens and melts, and is

decomposed at about 200°–210° C. with evolution of gaseous products of decomposition. Elementary analysis points to one of the three following formulas: $C_{42}H_{70}O_{21}$, or $C_{42}H_{72}O_{21}$, or $C_{42}H_{74}O_{21}$. This new sweet principle is doubtless a true glucoside, being split up on hydrolysis into an acid body and glucose.—Pharm. Ztg., liv (1909), No. 4, 39; from Arb. a. d. Kaiserl. Gesundheitsamt, xxviii (1908), 420.

Sonchus Oleraceus—A Reputed Cure for the Opium Habit.—Prof. Albert Schneider, basing his information on verbal reports of M. L. Fong, an educated Chinese gentleman, born in Oakland, California, and formerly private secretary to the Chinese Consul-General Tun Sze-yu, calls attention to the reputed value of the sow-thistle" (*Sonchus oleraceus*) for the cure of the opium habit. The chemical constituents of this plant have not yet been accurately determined. It contains a bitter principle, some resin, some rubber, and perhaps a narcotic principle, and has pronounced laxative properties. Its use as an opium-habit cure is said to have originated in the Hawaiian Islands. Somewhat over a year ago Consul-General Tun Sze-yu, assisted by Chinese merchants of Oakland and San Francisco, established several stations where the remedy was prepared and distributed freely to all who wished to try it. The plants (herb, stem and leaves) are collected at any time during the flowering period, placed in large kettles, water is poured on and a decoction made by boiling from eight to ten hours. The prolonged boiling is said to reduce the laxative properties. This decoction with a pinch of salt is taken *ad libitum* once a day, a teacupful or more constituting an average dose. The laxative properties, which are quite pronounced at first, leave very appreciably in the course of three or four days. The time required to effect a cure varies from ten days to two months or longer. From the more or less imperfect records, it appears that at least 25 per cent. who have taken the treatment are permanently cured, and that the failures are probably due to a want of persistence or inability, for constitutional reason to persist in the treatment; but from all evidence obtainable, this remedy is well worthy of more careful investigation.—Pacif. Pharm., July, 1908, 113–115.

RUBIACEÆ.

Borreria Sp.?—A South American Antidote for Snake Bite.—Writing from Uniao de Victoria (Paraná, Brazil), Albrecht Onken calls attention to a plant used by the Indians as a remedy and antidote against snake bite. The plant is called

Herva de Lagarto, and the author has witnessed and describes its actual and successful use in the case of an Indian child bitten in the foot by a "Gnatiara," a most venemous serpent. The treatment consisted in applying the freshly-expressed juice of the plant, gathered shortly after the accident, to the wound, whereupon the bleeding immediately ceased, and

following this by the administration of a strong decoction of the same plant. The child was able to go about as usual within a few hours after this treatment. It is claimed that the remedy is effective even when applied several hours after the bite has been inflicted. A specimen of "herva de lagarto" enclosed in Mr. Onken's letter has been identified as a rubiaceæ, belonging to the genus *Borreria*, but the paucity of material prevented the identification of species.—Pharm. Ztg., liv (1909), No. 46, 453.

Bolivian Cinchona Barks—New Varieties.—C. Hartwich describes three specimens of true cinchona bark recently collected by Dr. Herzog during a botanical excursion in the East Bolivian Andes. They are designated respectively as China *morada*, China *canela*, and China *anaranjada* (= orange-colored). Of these, the China canela is regarded as the most valuable by the natives, but the determination of alkaloid shows it to contain only 4.65 per cent. total alkaloid, whereas the China morada yielded 5.48 per cent. The latter and China anaranjada show identical structure and are evidently obtained from identical species, the difference in color being due to the fact that the anaranjada bark is peeled. It is the poorest in alkaloid content, containing only 3.65 per cent. In the absence of flowers and fruits, Dr. Herzog was unable to identify the species of *cinchona* from which the several barks are derived. Prof. Hartwich describes their pharmacognostic and microscopic characters.—Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 16, 249–252.

Java Government Cinchona—Chemical Researches.—In a critcal review by Dr. van Gorkom, of the Annual Report of the Agricultural Department of Java, the following concerning the chemical researches undertaken in connection with the cinchona cultivation in Java will be found particularly interesting: "It had been shown previously that *C. Ledgeriana* bark reached its maximum quinine-content when the trees were from five to six years old, but that with hybrids and *C. robusta* the maximum was reached at a later stage. Further micro-chemical investigation shows that in bark from grafts the cinchonidine-content is about the same in all varieties and generally larger than in that of the mother plant. Many experiments have also been made on the effect of manuring cinchona-plants with potassium chloride, superphosphate, or ammonium sulphate in various combinations. These all seem to exert a favorable influence on the formation of quinine, but the effects are doubtful, since unexpectedly good results were obtained with bark grown on two unmanured plots. In his comments Dr. van Gorkom calls attention to this point, and also mentions that definite conclusions cannot be drawn from such experiments unless full information is available with regard to the composition of the soil in which the experiments were carried out. Much attention has also been devoted to micro-chemical work, and the results obtained are summarized thus:

1. More alkaloid is present in young "Ledger" roots than in the stems of the same plant, and quinine is formed at an earlier stage in the roots than in the stem. 2. The rapid formation of quinine and quinidine does not begin until the plant is about one year old. 3. The nature of the humus added to the seed-bed has great influence on the formation of quinine in the root, and on this it mainly depends whether any quinine will be found in the roots seven months old. 4. In well-developed hybrids quinine can be detected by the herapathite reaction at the age of six months, whereas it can only be found in the stem at the age of eleven months. 5. It was shown previously that in Ledgeriana leaves from trees thirteen months old amorphous alkaloids were always found in addition to cinchonine and cinchonidine. New researches lead to the conclusion that in all well-developed leaves of a certain age cinchonine, cinchonidine, and amorphous alkaloids are all present.—Chem. & Drugg., Mar. 13, 1909, 432: from "Indische Mercuur," Feb. 2, 1909.

Cinchona Bark—Modification of Florence's Method of Determining Total Alkaloids.—N. H. Cohen recommends the following modification of Florence's method for the determination of total alkaloids in cinchona bark, which, in distinction from the original method, is both satisfactory and rapid: Five Gm. of the bark, in the finest powder, is macerated in a well-corked flask with 125 Gm. of ether; after well mixing, 5 Cc. of 15 per cent. caustic soda solution is added, and the gross weight of flask and contents noted. The mixture is allowed to stand for one hour, shaking up every five minutes; it is then boiled for thirty minutes under a reflux condenser. When cold, the original weight is made up by the addition of more ether. Five Cc. of water is then added, and the whole is well agitated. As much as possible of the ether is then decanted into another 250-Cc. flask and well shaken up with 20 Cc. of lime water. After sepation, exactly 100 Gm. of ether (= 4 Gm. of bark) is weighed off and run through a cotton-wool pledget into a tared flask. The ether is then distilled off and the residue weighed after drying for two hours at 100° C. The total alkaloid may be further purified, if desired, by re-solution in 10 Cc. of 2 per cent. sulphuric acid, again liberated with alkali, shaken out with ether and re-weighed after distilling off that solvent.—Apoth.-Ztg., xxiii (1908), No. 77, 702; from Pharm. Weekbl., 1908, No. 37.

Cinchona Bark.—Estimation of quinine by the insolubility of its sulphate in 10 per cent. aqueous sodium sulphate solution. See *Quinine*, under "Organic Chemistry."

Coffee—Extraction and Estimation of Caffeine.—A study of the extraction of caffeine from coffee by means of various solvents, by K. Lendrich and E. Nottbohm, reveals the fact that, other things being equal, the yield of caffeine obtained on extracting with chloroform, benzene, or carbon tetrachloride, varies with the amount of moisture in the

sample. The results may be summarized as follows: (1) Only 9.76 per cent. of the caffeine present is extracted from dried coffee in three hours, and extraction for a further period of nine hours removes practically nothing more. (2) From natural coffee, containing 8.4 per cent. water, 73.98 per cent. of the caffeine is extracted in the first three hours, and 12.20 per cent. more during the next nine hours. (3) The whole quantity of caffeine may be extracted in three hours from coffee containing 50 per cent. added moisture. (4) Incompletely extracted coffee may have its caffeine removed in three hours if moistened with 50 per cent. water. The estimation is carried out as follows: Twenty Gm. of finely ground coffee are left in contact with 10 Cc. of water for one or two hours, according as the coffee is roasted or raw; the mixture is then extracted for three hours with carbon tetrachloride. One Gm. of solid paraffin is then added to the extract, which is evaporated to remove the solvent; the residue is extracted with boiling water, filtered, and washed with boiling water, and the accumulated filtrates (about 200 Cc.), after cooling, are mixed with 10 Cc. of 1 per cent. potassium permanganate solution in the case of raw coffee, and 30 Cc. for roasted coffee. After a quarter of an hour the manganese is precipitated by boiling with 3 per cent. hydrogen peroxide solution containing acetic acid (100 : 1), and the solution is filtered. The filtrate is evaporated to dryness, dried for a short time at 100° C., and then extracted with chloroform. The chloroform is then evaporated, and the residue dried for half an hour at 100° C., and weighed. The purity of the caffeine isolated in this way can be checked by a Kjeldahl estimation of its nitrogen content; if the purification by permanganate is omitted the amount of caffeine calculated from the Kjeldahl estimation comes out 0.04 per cent. higher than the amount obtained by weighing the chloroform residue in the case of roasted coffee, but no difference is observable in the case of raw coffee.—Pharm. Journ., June 19, 1909, 826; from Ztschr. f. Unters. d. Nahr.-u. Genussm., *17* (1909), 241–265.

Ipecacuanha Root—Composition of Ash.—Attributing the failure to produce luxuriant growth of ipecacuanha plants cultivated near Klang, in the protectorate of Selangor, to a deficiency in the mineral constituents of the soil, E. M. Holmes conceived the expediency of determining the composition of the ash in Brazilian, Carthagena and in cultivated (Selangor) roots in order to secure the necessary data upon which any mineral deficiency might be supplied by fertilization. He therefore enlisted the services of Mr. G. S. Blake, an analytical chemist, since connected with a Baptist missionary expedition to Matto Grosso, who, having made the subjoined analysis, promises to examine the soil in which the ipecacuanha plants grow in that province, and other natural conditions under which the plant flourishes in the wild state.

Composition of Ash.	--	Brazilian.	Carthagena.	Johore.
		Per cent.	Per cent.	Per cent.
	Ash.	2.04	2.72	1.80
Potash	K_2O	25.53	7.42	28.55
Soda	Na_2O	2.70	2.25	2.06
Lime	CaO	15.50	17.00	16.87
Magnesia	MgO	13.57	10.68	14.25
Manganous oxide	MnO	0.30	0.58	0.45
Phosphoric oxide	P_2O_5	12.70	5.16	13.81
Sulphuric oxide	SO_3	7.40	5.05	8.57
Silica	SiO_2	11.02	—	10.50
Chlorine	Cl	trace	trace	trace

—Pharm. Journ., June 5, 1909, 765.

False Ipecacuanha—A New Sort from Bolivia.—Hartwich describes a false ipecacuanha root which was recently found by Herzog during a botanical journey in Bolivia. The drug is apparently derived from a species of *Cephaelis*, and is composed of roots and subterranean axillary portions. The roots are dirty gray-brown, 0.4–1.2 Cm. thick, and sparsely provided with thin rootlets. The annulations, so characteristic of ipecacuanha, are remarkably prominent, almost globular in shape, in some examples giving to them the appearance of irregular globules strung on a thread; in others the abnormal thickening of the bark is particularly noticeable in the axils. Microscopically this false ipecacuanha shows a structure which is closely related to that of the genuine drug. These distinctive features are shown in several drawings illustrating the author's paper, which may be consulted in Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 9, 128–129.

Morinda Citrifolia, L.—*Micro-Chemical Localization of Constituents in the Wood and Root.*—Supplementary of the recent study of the chemical constituents of the wood and root bark of *Morinda citrifolia*, L., by Oesterle and Tisza (see Proceedings, 1908, 215–216), O. Tunmann, operating with the same material, has made a study of the microscopic elements with the object in particular of determining the practicability of localizing the constituents of the drug by micro-chemical methods. The results of this study, which is described in detail and illustrated by several drawings showing the characteristic microscopic features, demonstrate the practicability of determining by micro-chemical examination the substances isolated by Oesterle and Tisza. *Morindin* is found principally, if not exclusively, in the medullary rays, *Soranjidiol* in isolated cells of the phloemparenchyme and along with morindin in the stone-cork, while *Morindadiol* is localized in the sieve-tubes. This localization points out that the anthraquinone derivatives of morinda bark must be regarded as utilizable products of cellular activity. Anatomically, the bark is characterized by the stone-cork, the sieve-tubes and raphide cells, together with

the absence of mechanical elements.—Pharm. Zentralh., xlix (1908), No. 50, 1013–1017.

CAPRIFOLIACEÆ.

Cornus Sericea—Proximate Examination of the Plant.—Edith Stockton and C. G. Eldredge have investigated the fruits of "kinnikinnik" (*Cornus sericea*) gathered at Sylvan Beach, N. Y. These were dark-blue, and consisted of a two-celled one-seeded drupe, each weighing one twenty-third of a Gm. The pulp contained potassium tartrate and oxalate, calcium oxalate, tannic, gallic and malic acids, together with several sugars, apparently fructose, and some gum. The nutlets yielded to ether an amber-colored fixed oil, consisting apparently of palmitin and olein.—Chem. News, Oct. 16, 1908, 191.

Viburnum Nudum—Proximate Examination of the Fruit.—Robert H. Lott has made a proximate examination of the fruit of *Viburnum nudum* gathered in the swampy portion around Sylvan Beach, N. Y. The dried fruit consist of berries that resemble commercial currants, and they have a similar odor, but they differ in that their color is bluish-black instead of brownish-black, and they are more elongated. The taste passes through different degrees of sweetness to that of a decided bitterness, very similar to that of wild cherry. The fruits weigh on an average 0.05 Gm. They contained about 43 per cent. of sugar, probably consisting of fructose and dextrose; ether extracted a fixed oil, which was difficult to saponify, and apparently an olein belonging to the same group as castor oil, almond oil, and olive oil, and containing an unsaponifiable portion from which a few minute crystals, supposed to be cholestrol were separated. Other constituents were albumen and tartaric and citric acids, the latter predominating. The ash from the berries amounted to about 4.48 per cent.—Chem. News, April 8, 1909, 170.

LORANTHACEÆ.

Aucuba Japonica—Distribution of Aucubin in Different Varieties.—The differences between varieties of *Aucuba japonica* are so marked that they suggested to C. Lebas the possibility of similar differences in chemical constituents, such as are found in the sweet and bitter almond. Six most divergent varieties of the plant were examined: *Aucuba japonica*, var. *elegantissima;* var. *latimaculata;* var. *longifolia;* var. *punctata;* var. *salicifolia;* and var. *viridis*. Aucubin was isolated in a crystalline condition from all.—Pharm. Journ., Dec. 5, 1908, 726; from Journ. de Pharm. et Chim., *28*, (1908), 469.

UMBELLIFERÆ.

Fennel—Gross Adulteration.—Charles Arragon calls attention to a parcel of fennel offered on the Swiss market which, although at the first glance of satisfactory quality, proved on closer examination to be grossly

adulterated. It consisted of 72.8 per cent. of fennel fruits, 16.7 per cent. of foreign seeds and 10 per cent. of yellow stones. The foreign seeds consisted mainly of damaged wheat grains, with a few poppy and lentil seeds and isolated oat grains. The stones were pieces of marble, uniform in size and colored yellow with iron-ochre. Moreover, the fennel fruits themselves were largely composed of such, deprived of oil by extraction, as well as partly split and decayed fruits, amounting to about 50 per cent. of the apparent fennel fruit content.—Schweiz. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 51, 818; from Ztschr. f. Unters. d. Nahr. u. Genussm., *16*, (1908), No. 7, 400–402.

Fennel Fruit—Grossly Adulterated Samples.—John A. Jennings and Henry Rodwell have in the course of drug examination during the past twelve months noticed the almost uniform inferiority of fennel fruit on the English market. With a single exception, seven samples examined have shown either deliberate adulteration or have exhibited great lack of care in gathering. Three of the samples contained 55, 32 and 48 per cent. of foreign substances, among which wheat screenings to the amount of 14, 71 and 40 per cent., respectively, and the other three samples contained impurities amounting to 50.5, 43.5 and 66 per cent., respectively, composed of various other umbelliferous fruits, dirt and what appeared to be unfertilized fennel fruits.—Pharm. Journ., Feb. 6, 1909, 147.

Imperatoria Ostruthium—Oxypeucedanin a Constituent of the Rhizome.—Having in the course of his investigations of pimpinellin (which see) successfully employed benzene instead of alcohol for its direct extraction from the root of *Pimpinella saxifraga*, J. Herzog endeavored to prepare "ostruthin," heretofore regarded to be the principal constituent of masterwort rhizomes (*Imperatoria ostruthium*) by the same process. For this purpose 5 Kgm. of masterwort rhizomes were extracted to exhaustion by boiling with 15 Kgm. of benzene, the extraction concentrated to 500 Gm., and 2 Kgm. of petroleum-ether added. On standing, a smeary, extract-like mass was deposited, which was separated from the clear yellow-green supernatant fluid, and mixed with ether. A nearly white crystalline magma was thus formed, which was separated from the ether by expression and repeatedly treated with boiling ether. After several recrystallizations, first from diluted alcohol and then from boiling acetone, about 1 per cent. of a pure, white, crystalline product was obtained, melting at 140°–141° C., which, however, proved on further examination not to be the expected ostruthin, but a body identical with the

Oxypeucedanin, which Erdmann had discovered and obtained in very small quantities from the roots of *Peucedanum officinale*. Experimental data fully agree with the description of the physical characters, chemical properties and elementary composition given by Erdmann, Bothe, Hlasiwetz and Weidel, Ernst Schmidt, Jassoy and Haensel, and others, of the

oxypeucedanin obtained by them from *Peucedanum*. The author has been able by a special process to isolate small quantities of ostruthin from the petroleum ether solution and to recognize its presence in the mother-liquors by its fluorescence. The drug employed was evidently derived from old plants, and since Gorup-Besanez, who has frequently prepared ostruthin from masterwort, insists that the rhizomes should be obtained from young (one or two-year old) plants, it is possible that the age of the plant has a decided influence on the constituents of masterwort rhizomes. —Arch. d. Pharm., *246* (Sept. 16, 1908), No. 6, 414–417.

ARALIACEÆ.

Aralia Hispida—Proximate Examination of the Fruit.—J. Milton Gilchrist has determined some of the constituents of the entirely ripe fruits of *Aralia hispida*, gathered at Sylvan Beach, N. Y., of a dark-blue or black color, becoming dark-brown when dried. The taste is slightly bitter, but in other respects resembles that of currants. The author determined the presence of 41.72 per cent. of sugar, having the character of fructose, and besides tartaric and citric acid, 7.98 per cent. of a fixed oil, having the saponification number of 517, which corresponds to a palmitate. The ash amounted to between 4 and 5 per cent. The berries being believed to be poisonous in some circles, a test for alkaloids was made with negative results. Nitrogen, determined by Kjeldahl's method, was present in the amount of 1.5 per cent., and probably represents albumen.—Chem. News, April 30, 1909, 211–212.

RANUNCULACEÆ.

Indian Aconite—Alkaloidal Content.—An examination by Dr. G. Weigel of a consignment of Indian aconite tubers (from *Aconitum ferox*, Wallach), by the method of Keller, determined the presence of 1.1 per cent. of total alkaloid, proving the Indian drug to be fully equal in alkaloid content to the European aconite (from *A. napellus*, L.). As is known, the tubers of the Indian drug are both larger and darker in color, and it must be remembered also that the pharmacological action of its constituents differs from that of the European drug.—Pharm. Zentralh., xlix (1908), No. 47, 958.

Japanese Coptis—Description.—Dr. G. Weigel has recently received a Japanese drug consisting of the rhizome of *Coptis anemonæfolia*, Sieb. et Zucc. which in its general appearance resembles hydrastis rhizomes, and like these contains berberine as active constituent. The drug is official in the Japanese pharmacopœia, and is used in Japan as a tonic in malaria, dyspepsia, etc. Although odorless, the taste is strongly bitter.—Pharm., Zentralh., xlix (1908), No. 45, 916.

Hydrastis—Cultivation.—Miss Alice Henkel and G. Fred. Kugh are the authors of a pamphlet recently issued by U. S. Dept. of Agriculture, in

which they describe the cultivation experiments made with goldenseal (*Hydrastis canadensis*). Goldenseal, in its native state, prefers open elevated woods and bluffs, where there is plenty of leaf mould and good drainage, and ranges from New York to Minnesota, southward to Missouri and Georgia. The plant has been cultivated, experimentally, at Washington by the United States Department of Agriculture since 1899. The results obtained clearly show that goldenseal can be successfully cultivated. The artificial conditions of cultivation must, however, be made to approach, as nearly as possible, those of its natural habitat. An ample supply of humus should be well worked into the ground to a depth of about 6 or 8 inches so as to give it lightness and moisture-retaining properties approaching those of a forest soil. The humus employed may be well-rotted manure, straw, etc., but probably the best mulch is leaf mold; this, of course, should be mulched in during the fall, and if a mulch of leaves should be laid on the ground every fall, in a few years the garden soil would have approached as nearly as possible to that of a forest soil; it also tends to keep the weeds down. Any soil may be used so long as it is well mulched to produce lightness and well drained, as goldenseal will not grow in a wet soil. As goldenseal is a shade plant, it must be protected, like ginseng, from the direct rays of the sun. Trees can be used for this purpose, but a better plan is to erect a lattice framework, as this will not, like trees, help to use up the strength of the ground. The plants may be grown in beds or rows about a foot apart in one direction by six inches in the other. They may be grown from the seed, by division of the rhizome, or from small buds which form on the stronger fibrous roots. The yield of green root per acre was found to be about 5000 or 6000 pounds, which when dried was reduced to 1500.—Bull. Pharm., Sept., 1908, 392; from Circ. No. 6, Bureau of Plant Industry.

MAGNOLIACEÆ.

Poisonous Star Anise—Admixture with True Star Anise.—Dr. G. Weigel directs attention to the continued complaint, coming from foreign sources, and particularly from Switzerland and Austria, that true star anise (from *Illicium verum*, Hook) occasionally contains a considerable proportion of false or poisonous star anise (from *Illicium religiosum*, Sieb.), and conjectures that the paucity of similar complaint in Germany is due to the fact that star anise is official in the pharmacopœias of the countries mentioned, and consequently subject to more critical examination, whereas in German pharmacy the use of star anise is restricted mainly to the preparation of a few specialties (teas, mouth-washes, etc.), and possibly to the manufacture of some "liqueurs." The well-known pharmacognostic characters of distinction of the two drugs should serve well for recognizing the admixture, which the author regards as being due to carelessness rather than intentional. In cases of doubtful quality, the test of taste

should be applied as a preliminary, since poisonous star anise is entirely devoid of the characteristic "anise taste" of the genuine drug.—Pharm. Zentralh., xlix (1908), No. 45, 914–915.

BERBERIDEACEÆ.

Caulophyllum Thalictroides—Proximate Examination of the Fruit.—Edith Stockton and C. G. Eldredge have made a proximate examination of the fruit of blue cohosh (*Caulophyllum thalictroides*). It consists of drupes with a very thin pulpy layer, which were green when first gathered (at Sylvan Beach, N. Y.) but on drying in an air-bath at 105° C. quickly turned blue, and became black as the drying proceeded. They possessed an odor something like that of bee-bread, were about the size of small marbles, and their average weight was about 0.2 Gm. The berries contained an abundance of reducing sugar, identified to be fructose, together with citric, tartaric and tannic acids. The nutlets yielded to extraction with ether a fixed oil of a golden-brown color, resembling olive oil in odor, and amounting to about 3 per cent. of the entire fruit. In some respects the properties of this oil would place it in the laurin group, in others to the olein group of oils. The ash, amounting to 0.081 Gm. from 2.034 Gm. of the fruit, contained SiO_2,Fe_2O_3,CaO,MgO,K_2O,Na_2O,SO_3 and P_2O_5.—Chem. News, Oct. 16, 1908, 190–191.

RUTACEÆ.

Medicinal Simarubaceous Plants—Active Constituents.—Charles Gilling gives a brief account of the active constituents which have so far been discovered in medicinal plants belonging to the Simarubeæ. This small natural order consists of thirty-one genera with about a hundred individual species distributed over Asia and South America. The plants are, for the most part, trees and shrubs, closely allied in their general features with the Rutaceæ, but differing in that they do not possess the oil glands which are such a conspicuous characteristic of the latter order. Some fifteen or sixteen of the genera include species which have had medicinal virtues ascribed to them—as bitter tonics, febrifuges and remedies for dysentery—all of them being extremely bitter to the taste. Referring for a more detailed description of the chemistry of the drugs derived from simarubaceous plants, the following may find place in the report:

Quassia Amara, L.—The wood contains a crystalline, bitter principle, "quassiin," the exact nature and composition of which is still in doubt. According to Massute (1890) it may be fractioned into four compounds of different melting-points and composition.

Picraena Excelsa, Lindl.—The wood of this closely-related plant contains, according to Massute, two crystalline principles, which he called "picrasmins," and which are distinguished from the quassiins.

Simaruba amara, Aublet (*S. glauca*, D. C).—The bark, according to

Greenish and Hooper (1905) contains a crystalline bitter substance, a crystalline non-bitter substance, a brown resin, and a fluorescent body. According to Gilling the bitter principle has the formula $C_{22}H_{30}O_9$.

Brucea sumatrana, Roxb.—The seeds, known as "Ko-sam" seeds, according to Power and Lees (1903) contain two amorphous bitter principles, neither of them identical with quassiin. From the bark of the shrub, Thomas isolated a bitter substance, not obtained in crystalline form.

Brucea Antidysenterica, Lam.—Power and Salway have recently obtained a bitter principle in an amorphous state from the fruits and from the bark.

Simaba Cedron, Planch.—Lewy has extracted from the seeds, known as cedron seeds, a crystalline bitter substance which he has named "cedrin." Tanret, who was unable to obtain this principle in a crystalline condition from these seeds, isolated from the seeds of another species,

Simaba Waldivia (1880), such a crystalline principle with perfect ease. from which he concludes that Lewy had probably worked with a mixture of seeds of the two species. Tanret assigned the formula $C_{26}H_{24}O_{10}.5H_2O$ to his principle.

Ailanthus Excelsa, Roxb.—D. Hooper (1875) obtained from the bark, which is recommended as a powerful febrifuge and tonic, a small amount of an amorphous bitter principle, and suggested that it might prove identical with quassiin.

Ailanthus Glandulosa, Desf.—The intensely bitter root-bark was subjected to proximate analysis by F. H. Davis (1885), but no definite bitter principle was isolated.

Picrasma quassioides, Ben.—The wood was stated by Dymock and Warden (1889) to contain a crystalline body, probably quassiin, a fluorescent body, a bitter resin, and an alkaloid; while Shimojama and Hierano obtained from the bark of a tree described as

Picrasma ailanthoides, Planch., which is identical with the above species, a small amount of crystalline substance having properties identical with quassiin.

Picrasma javanica, Blume.—D. Hooper states that the febrifuge bark of this tree contains a bitter principle allied to quassiin; while

Cascara amarga, the bark of a tree belonging to the genus *Picramnia*, yielded to Thompson (1884) a brown amorphous substance, which he called "picramnine," and which gave alkaloidal reactions.—Pharm. Jour., July 11, and Aug. 1, 1908, pp. 30 and 103–104.

BOMBACEÆ.

Barks as Food and Tea—Uses in India.—David Hooper mentions that the poorer classes of the Sitapoor district in India were discovered last

year to be eating a curious kind of "chupatti," or cake, made of the bark of the Simar tree,

Bombax malabarium, mixed with a little wheaten flour. Samples sent to the Indian Museum to ascertain if they were wholesome or injurious, were shown on examination to have a certain nutritive value, but lower by 27 per cent. than that of boiled rice containing a similar amount of moisture. A curious kind of tea, called

"*Mayin-cha*," sold in Calcutta, was also submitted by Mr. B. A. Gupte. It consisted of the outer scales of the bark of a tree said to be used as fuel. From its appearance, it resembled the bark of a mangrove.

Ceriops-condolleana, a tree common in the Sunderbans, the wood of which is largely used for fuel.—Pharm. Journ., 8, 1908, 161.

STERCULIACEÆ.

Cacao—New Method of Quantitative Estimation of Fat.—Taking advantage of the solubility of cacao fat in chloral alcoholate, as pointed out by Schaer and his students, Claussen and Mauch, A. Kreutz has determined the utility of the following method for its estimation: 1–1.5 Gm. of cacao and 2–3 Gm. of solid chloral alcoholate are melted together in a 100–150 Cc. Erlenmeyer flask on the water-bath. The thin magma, rendered homogeneous by stirring, is then mixed while still hot with 10–15 Cc. of ether, and after a homogeneous mixture results, 30–35 Cc. more ether is added, well shaken and filtered, the first portions of filtrate being returned to the flask if not perfectly clear. The residue on the filter having been washed thrice with small quantities of ether, the filtrate and washings are distilled in a tared flask, and the residual fat dried at 105°–110° C. to constant weight. Concordant results were obtained by this method.—Schweiz. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 31, 490–491; from Zschr. f. Unters. d. Nahr.-u. Genussm., 1908, No. 11, 680–683.

Cacao Powders—Fat Content of Commercial Sorts.—The Independent Union of German Food-Chemists have decided that cacao powders containing less than 25 per cent. of fat shall not be regarded as being a normal product. A. Beythien has recently examined 103 specimens obtained from 35 different manufacturers (25 German, 8 Dutch and 2 Swiss), and found 32 of the specimens to contain less than 20 per cent. fat, and 65 of them to contain less than 25 per cent. Of the 35 manufacturers, 13 produced cacao powders containing less than 20 per cent., 21 produced powders containing from 21–25 per cent., and 18 such containing over 25 per cent. of fat. In a critical review of Beythien's results and conclusions (which must be consulted in Zschr. f. Unters. L. Nahr. u. Genussm, 1908, 679–682), Dr. Otto Rammstadt questions the propriety of maintaining the standard adopted by the "Independent Union" above mentioned.—Pharm. Ztg., liv (1909), No. 22, 222–223.

Kola—Significance of Recent Researches.—Referring to the recent researches of Goris on kola nuts, which have demonstrated the existence in the fat of a crystalline tannin-containing substance, kolatine (see Proceedings, 1908, 414), A. R. L. Dohme, after briefly describing the distinctive characters of this new body and particularly its distinction from the "kola-tannin" of Knox and Prescott, points out kolatine is a body closely allied to the tannins and much resembling pyrocatechin in its reactions. It is unstable and hard to do much with in the research way. What is of moment, however, is that physiologically kolatine is the opposite of caffeine (with which it exists in the drug in chemical combination); both act on the heart and on the systolic energy of the same, but while caffeine accelerates the cardiac movements, kolatine diminishes them. This accounts for the fact that fresh kola nuts act so differently from dried or cured kola nuts, which do not contain any kolatine, and from which we obtain, hence, the full effect of the caffeine, whereas, in fresh kola nuts the kolatine prevents the caffeine from producing its effects. It follows that fresh kola nuts and preparations of them should be avoided, and the preparations made from dried kola nuts used in their place.—Amer. Journ. Pharm., Sept., 1908, 411–412.

TERNSTROEMIACEA.

Tea—Conditions Determining Quality.—The subject of what factors determine the quality of tea, and of the best methods of improving the quality of certain grades, has long occupied the attention of tea-growers, and has recently been most exhaustively studied by Dr. Harold H. Mann, Scientific Officer to the Indian Tea Association, who has embodied the results of his observations and experiments in pamphlet form. Hitherto no satisfactory explanation of the variation in the qualities of different teas has been forthcoming, and a complete answer cannot, in Dr. Mann's opinion, be given. Tea owes its value principally to three constituents: (1) Essential oil, producing the flavor; (2) caffeine or theine, producing the stimulating action; and (3) tannin, giving the astringency and, when fermented, the color to the liquor. The essential oil, though often spoken of, is in reality a material of which extremely little is known. It can only be said that it is an oily body which can be driven off from the tea at a high temperature, especially along with the steam when the leaf is wet. On exposure to the atmosphere the oil quickly changes into a resin with a very marked tea-like smell. It is evidently one of the chief factors in determining flavor in tea. It is equally certain that caffeine is the principal stimulating material in tea, and for long its quantity was supposed to bear, therefore, a close relationship to the market value. This supposition is now proved to be quite unfounded, and though the medicinal value of tea may vary with the quantity of caffeine, the market value certainly does not. It is, however, present in quantities which may vary from 3 to 5 per

cent. in good teas, and in the lowest grades it may go down to 2 or 3 per cent. The third constituent of tea of primary importance is tannin. This has generally, if not always, been considered by the medical profession as the objectionable part of tea; but the value of tea in the market, on the other hand, seems to be closely connected with the quantity of tannin easily extracted from the tea by boiling water. The teas, in fact, containing the most tannin usually have the greater value unless possessed of less flavor. The principal factors leading to the production of quality are stated by Dr. Mann to be:

1. Elevation and in a measure latitude.
2. Regularity and sufficiency of rainfall.
3. Variety of plant.
4. Special character of soil and manuring.
5. Kind of pruning.
6. Method of plucking.
7. System of manufacture.

Each of these factors has its influence, and these are exhaustively considered by Dr. Mann, who says it has too often been the first maxim learned by a young planter that "good tea is made in the garden and not in the factory," consequently comparative neglect of improvement and of close supervision and care in the factory has been the result. Now it is being more and more recognized that while good tea can be made by no known process from inferior leaf, in a vast number of cases the tea actually produced is inferior to what could, by closer supervision and better regulated manufacture, be made from the same leaf.—Chem. & Drugg., June 19, 1909, 957.

Tea—Micro-Chemical Study and Determination of Caffeine Content in Various Sorts.—C. Hartwich and Paul A. Du Pasquier communicate the results of a compendious study, undertaken for the purpose of satisfactorily localizing the caffeine in the cellular tissues of tea leaves. The microchemical determinations of the caffeine was made by the use of auric chloride and hydrochloric acid after the removal of the tannin by means of water. The caffeine was found essentially in the pallisades, in the spongy parenchyme, in the middle nerve, in the medullary rays and in the phloemparenchyme, as also in the collenchyme layer beneath the epidermis. A study of the physiological function of caffeine in the tea plant, led to the determination that caffeine is a product of albumen disintegration, such as occurs in a number of similarly constituted bodies in the animal and vegetable kingdom. This observation confirms the view, increasingly gaining ground, that no elementary differences exist between vegetable and animal assimilation. Furthermore, the authors have investigated the extent to which the content of free caffeine is increased by the treatment to which the fresh leaves are subjected in the preparation of commercial teas. They publish the results of examination of a large

number (19) of the rarer sorts of tea, in the form of a table, which leads up to some concluding remarks concerning the influences that may affect the caffeine content of teas. In brevity, these are as follows:

1. Bud-teas, which are obtained by simply drying the young buds contain the largest percentage of combined caffeine.

2. The lowest percentages are found in the teas of Hinter-India, which is ascribable to the crude methods of preparation and moist preservation.

3. The inferior content of combined caffeine in Chinese "green" teas, as compared with "black" teas, is apparently due to the fact that black teas do not suffer materially by the fermentation to which they are subjected during their preparation, whereas the process of roasting, to which green teas are subjected affects the caffeine content very unfavorably.—Apoth. Ztg., xxiv (1909), Nos. 12, 13, 14 and 15, pp. 106, 119, 130 and 136.

GUTTIFERÆ.

Indian Garcinias—Economic Uses.—David Hooper publishes some interesting notes, abstracted from the Annual Report of the Industrial Section of the Indian Museum for 1907–8, among these the following concerning two species of *Garcinia*:

Garcinia Cowa, Roxb.—This is a tall evergreen tree of Eastern Bengal, Assam, Chittagong, Burma, and the Andaman Islands. This species produces a kind of gamboge of a paler color than that of *G. morella*, and, according to Mason, is insoluble in water. It has been described as forming with oil of turpentine a beautiful and permanent varnish for metallic surfaces. An analysis of a sample of the gum-resin from the Chittagong district revealed the following composition:

Moisture	6.5
Resin	84.3
Gum	5.6
Residue	2.5
Ash	1.1
	100.0

While it has similar constituents to those of ordinary commercial gamboge, the proportion of resin is much higher.

Garcinia Pedunculata, Roxb.—The sliced and dried acid fruits of this tree are used as a mordant in dyeing, as an adjunct in food, and as a refrigerant drink or sherbet. The drug is called "Heibung" in Munipur, and "Metlin" in Burma, and belongs to a class of acid vegetables used in the East to which the generic name "Amsul" is applied. Three samples in the museum contained respectively 13.29, 18.04, and 19.7 per cent. of malic acid. The dried fruits retain their acid property for several years without deteriorating.—Pharm. Journ., Aug. 8, 1908, 161.

VITACEÆ.

Ampelopsis Quinquefolia—Proximate Constituents of the Fruit.—Lois R. Poyneer and H. Leroy Duffin have determined some of the proximate constituents in the fruits of the *Virginia creeper* (*Ampelopsis quinquefolia*). The ripe blackish berries picked from the vines on the Cornell College Campus, when dried at 105° C., assayed about 0.116 Gm. in weight. They were found to contain about 60 per cent. of a fermentable sugar, evidently fructose, and besides oxalic and tannic acids, yielded on extraction with ether 11.27 per cent. of fixed oil, which separated in two portions on standing, the one considerably darker and heavier than the other. The sp. gr. of the two portions together was 0.9503, and they probably consisted of palmitin and olein. The ash of the fruit amounted to 4.88 per cent.—Chem. News, Feb. 26, 1909, 100.

Red Grapes—Origin of Color.—Malvezin and Saunier record the results of experiments undertaken with the object of determining the origin of the color of red grapes. The green seeds of red or white grapes were heated in an open flask with water at 85° C. After 17 hours the liquids had assumed an intense yellow, and after 24 hours a splendid wine-red color; but if the heating was done under the exclusion of air, the change of color from yellow to red did not occur. The authors conclude from their experiments, that by the action of air, heat, and possibly also light, a single chromogenous body is thus transformed, and that the same transformation is effected in nature by the action of enzymes in the red grapes. The formation of the red coloring body in white grapes is impossible in nature; in all probability, because white grapes do not contain the necessary enzymes.—Pharm. Ztg., liii (1908), No. 91, 901; from Compt. rend., *147* (1908), 384.

Samos Wines—Composition.—In recent years Grecian wines find their way into the German market in increasing quantities, more particularly the Muscat wines and wines produced in the island of Samos. Some of these wines are more or less artificial products, or are prepared from raisins and contain excessive quantities of added alcohol. Having come into possession of a number of natural wines produced in Samos, all of indisputably genuine quality, Dr. J. Boes has subjected them to analysis and finds them to have the following average composition:

100 Cc. of wine contain:

Alcohol	11.27 –12.19 Gm.
Total Acid	0.32 – 0.33 Gm.
Ash	0.26 – 0.33 Gm.
Phosphoric Acid (calculated as anhydride)	0.023– 0.03 Gm.
Extract	22.42 –22.96 Gm.
Invert Sugar	19.26 –19.45 Gm.

These wines are made from the juices of grapes which have been ex-

posed only a short time to the sun before expression. Owing to the climatic conditions of Greece, the fermentation of these wines is intercepted by the addition of some alcohol at a certain stage of the process. The above-mentioned "raisin wines," however, may contain as much as 14 to 17 per cent. of alcohol.—Apoth. Ztg., xxiii (1908), No. 60, 539.

Wines—New Method of Determining the Fixed and Volatile Acids.—Emm. Pozzi-Escot recommends the following new method for the estimation of the fixed and volatile acids in wines: 100 Cc. of the wine are evaporated to 3 to 4 Cc., treated with excess of alcohol, and filtered. The filter is ignited in a muffle furnace, and thus the insoluble salts of the wine are determined. Their alkalinity is determined by titration with nitric acid. Another 100 Cc. of the wine are evaporated to 3 to 4 Cc., neutralized with baryta, and 100 Cc. of alcohol at 96° C., containing 2 per cent. of barium bromide, are added. The fixed acids are thus precipitated as barium salts, and the volatile acids remain in solution. The precipitate is filtered off, ignited, and titrated with nitric acid. The difference between the first titration and the second gives the fixed acids. The fixed acids minus the total acidity of the wine gives the volatile acids. The method does not give the exact results in the presence of lactic acid, which, however is exceptional.—Chem. News, Sept. 25, 1908, 162; from Compt. rend., *147* (1908), No. 4.

Wines—Determination of Constituents by the Electric Conductivity of the Sample—Paul Dutoit and Marcel Duboux find that by neutralizing and measuring the electrical conductivity it is possible to determine simultaneously the sulphates, the total acidity, and the tanning matter in wine. A concentrated solution of alkali is added to the wine in small portions, and the conductivity is determined after each addition. The graphic representation of the values thus obtained gives a curve which is characteristic of each wine and each alkali. When baryta is used as alkali the curve assumes a definite form, and from the lengths of certain parts of the curve it is possible to determine accurately the constituents of the wine. —Chem. News, Aug. 21, 1908, 96; from Compt. rend., *147* (1908), No. 20.

HIPPOCASTANEÆ.

Aesculus Hippocastanum—Yield and Characters of Fixed Oil from Fruits.—Stillesen has examined the fixed oil of horse-chestnuts, which he obtained from the dried fruits in a yield of 1.5 to 3 per cent. The oil contains traces of a mustard-like volatile oil which, however, could not be isolated. The sp. gr. at 15° C. was 0.9260; refraction index at 20° C., 1.4747; saponification number, 194.5; iodine number, 95.4; Reichert-Meissl number, 1.54; Hehner number, 92.9; acetyl number, 13.5. The oil is mainly composed of olein, containing besides small quantities of linolein, palmitin and stearin. Sulphur was not present. It is intermediate

between the half-drying and non-drying oils.—Pharm. Ztg., liv (1909), No. 46, 452: from Chem. Ztg., 1909, No. 55.

ERYTHROXYLACEÆ.

Coca and Cocaine—A Historical Study.—Dr. Gordon Sharp contributes a comprehensive study of coca, its alkaloidal constituents and their substitutes, which will doubtless prove highly interesting to investigators of the subject of coca. The author considers his subject on historical lines, beginning with the earliest knowledge concerning the drug and its uses, the paper appearing in three instalments of several pages each under the following sub-headings: The Two Garcilasos (de la Vega); Milton and Cowley; Attitude of Church and State Toward Coca Chewing; The Plant First Brought to Europe; Diverse Views on the Virtues or Vices of Coca; Experiences of Markham and Christison; Origin of the Name Coca; Confusion with Cocoa or Cacao; Botanical and General Description; Description of the Custom of Coca Chewing; Can Coca do all that the Peruvian Claims for It; Chemistry; Steps in the Synthesis of the Alkaloids; Coniine and Atropine; Cocaine and the Coca Alkaloids; Decomposition of Cocaine and the Coca Alkaloids; Partial Synthesis of Cocaine; Close Relationship of Ecgonine and Tropine; Relationship of Cocaine and Atropine; Substitution Compounds for Cocaine; Pharmacology and Therapeutics.—Pharm. Journ., Jan. 9 and 30, and Feb. 13, 1909, pp. 28–30, 117, 118, and 184–186.

Bolivian Coca—Varieties.—Hartwich describes a number of different cocas which were collected by Herzog during his recent botanical journey in Bolivia. One of these corresponds in its characters with those of the commercial drug, a second is derived from *Erythroxylon ulei*, Schultze, and a third from *Erythroxylon subracemosum*, Turcz. These last two sorts are used in eastern Bolivia, where the genuine drug is not found, for coca-chewing. The leaves of *E. ulei*, Schultze, are not an article of commerce, although they are used in the localities of their growth as a remedy in stomach affections; the same may be said of the leaves of *E. subracemosum*, Turcz, which forms the undergrowth in palm forests. Neither of these leaves were found to contain alkaloid. The author mentions in this connection that the leaves of *Sebastiana nervosa*, Müll. Argov. (euphorbiaceæ), are used as in Bolivia as a substitute for coca, while the leaves of *Coussarea hydrangeaefolia*, Benth. et Hook. (rubiaceæ) are used both whole and in powdered form as a substitute for "mate." The author gives a microscopic description of the several leaves examined, illustrated with ten drawings, exhibiting the important microscopic elements, which may be consulted in Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 13, 193–199.

Java Coca—Presence of Crystallizable Cocaine.—The question of the presence of crystallizable cocaine in Java coca leaves has been decided

definitely by the comprehensive experiments of De Jong. The cocaine isolated from the extract and purified by fractional precipitation was found to be crystallizable, although with difficulty. It melted at 96°–97° C.; its optical rotation was $(a)_D$ —16.1°.—Pharm. Ztg., liii (1908), No. 99, 983; from Chem. Weekbl., *5*, 666.

Mexican Coca—Characters and Alkaloidal Content.—Dr. G. Weigel directs attention to Mexican coca leaves which have recently been offered on the Hamburg market. In their form, color and structure these leaves resemble the tender, grass-green coca leaves from Java, which are said to be derived from the same species of *Erythroxylon* from which the Truxillo coca is derived (*Erythroxylon truxillense* Rusby = *E. spruceanum* Burk). The Mexican drug on examination yielded 1 per cent. of total alkaloid. In this connection the author mentions that a consignment of

West African Coca was received in the beginning of the year, which is probably also derived from *E. truxillense*, and has been found to yield 0.82 per cent. of total alkaloid. Notwithstanding their high alkaloid content, however, these new varieties of coca appear to be of inferior value for cocaine manufacture, since the alkaloidal content is largely composed of secondary (uncrystallizable) bases, in this respect also resembling Ceylon and Java coca leaves.—Pharm. Zentralh., xlix (1908), No. 48, 976.

Coca Leaves—Improved Method of Alkaloidal Estimation.—A. W. K. de Jong recommends the following method for the assay of coca leaves, which gives results in close agreement with those of Keller's method and in a much shorter time: The finely-powdered leaves, 12.8 Gm., are mixed with 5 Cc. of 25 per cent. solution of ammonia and extracted in a Soxhlet apparatus for ten to fifteen hours with petroleum spirit. The extract is transferred to a separating funnel and the leaves extracted for three hours with a fresh portion of ether to ensure complete removal of the alkaloids. The united extracts are shaken, first with 50 Cc. and then with 25 Cc. of 0.5 per cent. hydrochloric acid, and the acid extracts filtered and shaken with ether. The ethereal layer is separated and the aqueous layer rendered alkaline with ammonia and again extracted, first with 50 Cc. and then twice with 25 Cc. of ether. The three ethereal extracts are distilled in a tared flask and the residue dried and weighed.—Pharm. Journ., June 5, 1909. 768; from Rec. Trav. Chim. Pays-Bas, *27* (1908), 419–421.

SAPINDACEÆ.

Naphelium Lappaceum—Toxic Saponin in the Fruit Shells.—J. Dekker has isolated a toxic saponin from the fruit shells of *Naphelium lappaceum* by a method described in detail. The saponin dissolves in sulphuric acid with a yellow color, which changes to purple, and throws down a dark red flocculent precipitate. On floating a solution of the saponin in acetic acid on to sulphuric acid a brown ring is formed; when hydrolyzed with dilute

acid a soluble reducing body and an insoluble crystalline substance are formed.—Pharm. Journ., Jan. 2, 1909, 6; from Pharm. Weekl., *45* (1908), 1156.

POLYGALACEÆ.

False Senega—A Sophistication from Italy.—C. Hartwich calls attention to a false senega which has recently appeared on the market from Italy, and which on superficial examination may be easily mistaken for genuine senega. It consists of roots, usually 9 Cm. long, but occasionally up to 15 Cm., which are sparingly branched, in isolated instances more profusely, thickened at the upper extremity up to 7 Mm., but mostly much thinner and tapering towards the nether end. The light yellow-brown roots are only moderately wrinkled transversely: the outer surface of the bark peels off in spots; they are in most pieces much less contorted than the genuine root, and the keel on the concave side of the contortions, which is so characteristic of the genuine drug, is completely absent, as is also the knotty root-head, which in most pieces consists simply of the remains of thin, articulated hollow stems. The author gives a comprehensive description, accompanied by illustrations, of the microscopic structure of this false senega, which exhibits a marked resemblance to the microscopic features of ipecacuanha roots. While unable to identify the botanical source of the drug definitely, his observations point to either the Polygalaceæ or Rubiaceæ as the probable source, and he is inclined to believe the latter to be the family to which the parent plant of the false senega belongs.—Schw. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 34, 537–540.

False Senega—A Second Sort.—Since describing the false senega mentioned in the preceding abstract, C. Hartwich has received a specimen of senega (imported from France) which was adulterated to the extent of 15 per cent. with a false senega root bearing a close resemblance in its external appearance to the genuine drug. The adulterant is composed in about equal proportions of root fragments and of the detached knotty crowns, the latter preponderating somewhat. The color of the drug is pale yellow-brown, resembling that of the genuine drug. The root fragments vary in size up to several centimeters in length and 4 Mm. in diameter, are somewhat longitudinally wrinkled and in most fragments distinctly contorted. Here and there a keel is also in evidence; its presence is however not ascribable to the same causes that determine its presence in the genuine roots. But while the external characters of the false senega closely resemble those of the genuine, the microscopic characters of a transverse section clearly reveal a distinction which cannot be mistaken. These characters of distinction are illustrated in a cut accompanying the author's description which must be consulted in the original. Aside from certain peculiarities in structure, the drug is characterized by the absence of fiber, stone-cells, oxalate and starch. The botanical origin of the drug

has not yet been determined.—Schw. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 47, 749–751.

FUMARIACEÆ.

Chinese Corydalis—Alkaloidal Constituents of the Tubers.—Dr. K. Makoshi has made a chemical investigation and study of the alkaloids of Chinese corydalis tubers, which, according to Professor Shimoyama are derived from *Corydalis ambigua*, although the Japanese botanist Yokusai assigns *Corydalis bulbosa var. rotundifolia* as their botanical source. But while Haars obtained several years ago (see Proceedings, 1905, 652) from the tubers of *Corydalis cava* 4.9 per cent. of total alkaloids, Dr. Makoshi was unable to obtain more than 0.09 per cent. of crude alkaloids. These consisted principally of corydaline and corybulbine, which are also the principal alkaloids of *Corydalis cava*, but contained also protopine, an alkaloid frequently found in plants of the Papaveraceæ and Fumariaceæ, but not yet associated with the alkaloids of *Corydalis cava*. Besides these, Dr. Makoshi obtained two alkaloids not heretofore described, which are still under investigation.—Arch. d. Pharm., *246*, No. 5 (July 24, 1908). 379, 400.

Discentra Pusilla, Sieb. et Zucc.—Constituents.—Y. Asahina has isolated from *Discentra pusilla*, Sieb. et Zucc., a graceful herb growing on high mountains in Central and Northern Japan, a yellow crystalline body and two alkaloids, the one identified as protopine, the other a new alkaloid which the author has named

Discentrine. This, when pure, forms nearly colorless, shining prisms, which do not lose weight at a temperature of 125° C. and melt at a temperature of 168°–169° C. The freshly precipitated amorphous base is readily soluble in ether, but it is difficultly soluble when in the crystallized form. It is copiously dissolved by hot absolute alcohol, but on cooling, well-formed prisms and needles are deposited. In chloroform it dissolves very readily, as also in dilute acetic acid, but its salts, with the different mineral acids, are usually sparingly soluble. The composition of discentrine corresponds with the formula $C_{20}H_2NO_4$, and its optical activity is $(a)_D = +62° 67'$. The hydrochloride, platinochloride, hydrobromide and nitrate have been prepared and are described. The

Yellow Crystalline Body forms faint yellow, fine needles, soluble in alkali solutions, with an intense yellow color, and, according to the analytical results obtained, consists apparently of a monomethyl quercetin, probably *isorhamnetin*.—Arch. d. Pharm., *247* (1909), No. 3, 201–212.

PAPAVERACEÆ.

Opium—New and Simple Method of Morphiometric Assay.—James A. Arkin recommends the following method for making the morphiometric assay of opium, which is based upon a a process outlined by E. Legér

in 1903: Six grams of finely powdered opium, previously dried at 60° C. in an air-bath for one-half hour, are mixed with 60 Cc. of a ten per cent. aqueous solution of sodium salicylate in a wide-mouthed bottle of about 100 Cc. capacity, which is then carefully stoppered, vigorously shaken for five minutes, and then occassionally for one hour. The mass is then expressed and 45 Cc. of the liquid are collected in a wide-mouthed glass-stoppered bottle; a mixture of 2 Cc. of 10 per cent. ammonia and 8 Cc. of ether is added, the bottle is well shaken for ten minutes and then set aside for twenty-four hours. The white, non-adherent deposit is collected on a counterpoised filter of 9 Mm. diameter, the filtrate being used to wash the crystals from the flask, followed by three rinsings with 10 Cc. each of distilled water. After draining completely the filter and contents are then washed with three successive portions of 10 Cc. each of distilled water, each portion being kept in the funnel for five minutes by means of a rubber tube and pinch-cock attached to the stem. The filter and contents are then dried at 100° C., and washed with three portions of 10 Cc. each of benzene and again dried at 100° C., brought to room temperature and weighed. The alkaloid so obtained is anhydrous, and the ascertained weight must therefore be increased by 5.94 per cent., the difference between anhydrous morphine and the crystallized morphine of the U. S. P. standard. The actual percentage is then calculated in the usual manner on the basis of the aliquot portion of filtrate used.—Pacif. Pharm., June, 1909, 39–41.

CRUCIFERÆ.

Mustard Seed—Adulterants of the Powder.—E. Rupp and M. Kürbitz find that the most common adulterant of "sem. sinapis pulv. gross." is the residue of the volatile oil distillation. They suggest 5 per cent. of ash as the limit for a normal powder, and recommend the following simplified method for determining the percentage of fixed oil: 5 Gm. of the powder are shaken occasionally during 24 hours with 50 Gm. (or Cc.) of ether; then 25 Gm. (or Cc.) are evaporated on the water-bath, and the residue is weighed. Any artificial coloring is usually recognized by the color of the oil so obtained.—Apoth.-Ztg., xxiv (1909), No. 18, 160.

Expressed Mustard Oil—Adulteration with Sesame Oil.—C. T. Bennett calls attention to a recent importation of mustard oil from India, which on examination proved to consist principally of sesame oil. It is paler in color than the genuine oil expressed in England, gives a well-marked violet color with Tocher's test, and has the following characters:

Specific gravity	0.917
Acid-number	13.9
Saponification-number	182.6
Iodine-number	101.5
Melting-point of fatty acids	25° C.

Judging by the color-reaction and the high melting-point of the fatty acids it would appear that the oil in question contains about 75 per cent. of sesame oil, and the high acid-value (equal to 6.9 per cent. oleic acid) shows that an oil of very low grade has been used. This is to be expected, as good sesame oil has a greater money value than mustard oil.—Chem. and Drugg., Dec. 19, 1908, 940.

SAXIFRAGACEÆ.

Currant Seeds—Character of Fixed Oil.—Krzizan has extracted the fixed oil from two parcels of currant kernels, the one of Italian, the other of Bohemian origin, obtaining 16 per cent. of oil from the Italian kernels and 18.5 per cent. from the Bohemian. The oil from the Italian seeds was orange-yellow; when spread on glass plates, it dried within 3 or 4 days, forming an elastic pellicle. The following constants were determined: Specific gravity at 15°, 0.9265; saponification number, 189.9; iodine number, 172.3; Reichert-Meissl number, 1.1; acid number, 40.6. This oil contained 0.14 per cent. of sulphur. The oil from the Bohemian seeds contained no sulphur, but, with the exception of a very low acid number (= 2.9), it had practically the same constants as the oil from Italian seeds. The author surmises that the latter contains an enzyme which splits up the fat.—Pharm. Ztg., liv (1909), No. 28, 281; from Chem. Rev., 1909, 1.

Black Currant Leaves—Reputed Value in Rheumatism.—Huchard has been investigating the use of black currant leaves (*Ribes nigrum*) in infusion for the treatment of chronic and sub-acute rheumatic affections. Taken at night, it appears to act as a stimulant to the renal epithelium, promoting diuresis with increased elimination of incompletely oxidized nitrogen. Chevalier showed the presence in the leaves of a volatile oil, which splits up into quinic acid and a very active oxydase, and Huchard has had an active preparation made from the fresh leaves, in which each gramme corresponds to 0.1 Gm. of the fresh plant. The dose of this preparation is from 1 to 3 teaspoonfuls a day.—Pharm. Journ., April 17, 1909, 528; from Journ. des Practiciens, through The Practitioner, March, 1909, 428.

HAMAMELIDEÆ.

Hamamelis Virginiana—Galls on the Leaves.—Rosenthaler has examined the galls occurring on the leaves of *Hamamelis virginiana*. The galls are brown, somewhat conical excrescences, extending from the surface of the leaf in a standing direction, and vary in size, the largest being about 0.5 Cm. in diameter at the base and up to 1 Cm. in length. The cells of the parenchyme contain tannin.—Pharm. Ztg., liii (1908), No. 73, 713; from Ber. d. D. Pharm. Ges., 1908, No. 343.

CACTEÆ.

Opuntia Vulgaris—Mucilage of the Leaves to Kill Mosquito Larvæ.—According to Sauzeau, the leaves of *Opuntia vulgaris*, which is common in most hot countries, give, when cut up and bruised with water, a kind of mucilage which spreads on the surface of the water and prevents the mosquito larvæ from rising to the top to breathe. This action of the mucilage persists for several weeks, and often for months, whereas paraffin oil, which is generally used, is volatilized in hot weather in about twenty days.—Pharm. Journ., August 1, 1908, 112; from L'Union Pharm., *49* (1908), 319.

CUCURBITACEÆ.

Colocynth Seeds—Oil and Bitter Principle.—David Hooper observes that the seeds of *Citrullus colocynthis* contain, in addition to a fixed oil, a bitter principle similar to that found in the fruit-pulp. A sample of the seeds from Baluchistan afforded 17.8 per cent. of a yellow, drying oil with the following constants: Acid value, 5.9; saponification value, 202.9; iodine value, 129.3; fatty acids, 92.2; melting-point of fatty acids, 29° C. —Pharm. Journ., Aug. 8, 1908, 161.

Colocynth—Characters of the Fixed Oil of the Seeds.—Grimaldi and Prussia obtained about 17 per cent. of fixed oil from colocynth seeds by extraction with carbon tetrachloride, simple expression being inexpedient. This oil was reddish-yellow with faint green fluorescence, had a faint odor, inherent to all cucurbitaceous seeds, and a somewhat bitter taste. The oil was barely soluble in alcohol, but readily in ether, chloroform, petroleum ether, etc. Among other constants, the following are noteworthy: Specific gravity at 15° C., 0.9289; congealing point, 14° C.; index of refraction at 15° C. = 78.2, at 25° C. = 72.3, at 40° C. = 63.5; acid-number, 2.7; saponification-number, 191.7; Hehner number, 90.72; iodine number, 120.37; Reichert-Meissl number, 0.32.—Pharm. Ztg., liv (1909), No. 28, 281; from Boll. Chim. Farm., 1909, No. 3.

MYRTACEÆ.

Brazil Nuts—Percentage of Fixed Oil and Proteid Substances.—Hugo Kühl has determined Brazil nuts (para-nuts or vulvia-nuts), the seeds of *Bertholletia excelsa*, Hb., to have an average fat content of 62.73 per cent., with 2.59 per cent. of nitrogen, corresponding to 16.20 per cent. of protein substances.—Pharm. Ztg., lix (1909), No. 6, 58.

Cloves—Percentage of Stalks in Commercial Sorts.—In view of the present official requirement in the Swiss "Food Book" that cloves should not contain more than 2.5 per cent. of peduncles (clove-stalks), whereas in the previous (1st) edition of the book 5 per cent. of stalks were permitted, Dr. Paul Bohny has examined the different commercial sorts with results that demonstrate the present requirement to be too stringent,

and that the original requirement of 5 per cent. accords with the percentages found in the cloves at present found on the market—the exception being "Amboina" cloves, which were found in a single sample to contain the abnormally low percentage of 1.2 per cent., while three others contained respectively 2.9, 3.1 and 3.1 per cent. of stalks. But the high price of "Amboina" cloves makes their sale almost prohibitive, and the market is therefore almost exclusively supplied with "Zanzibar" cloves. Samples of the latter, obtained from different sources, showed the following percentages: London, 1907, 42 per cent., 5.1 per cent. and 4.5 per cent.; Amsterdam, 1907, 8.5 per cent.; Rotterdam, 1905, 4.2 per cent. Five average samples from large parcels of 1907 "Zanzibar" cloves, showed 3.0, 5.7, 3.3, 4 0 and 3.9 per cent. of stalks. respectively; five parcels of 1908 cloves: 4.7, 4.6, 4.5, 4.0 and 3.4 per cent., respectively. The averages are thus shown to be from 4 to 4.3 per cent. of stalks, and a limit of 5 per cent. is considered a reasonable requirement.—Schweiz-Wschr. f. Chem. u. Pharm., xlvi (1908), No. 35, 545.

Cloves—Analysis—T. R. Hodgson communicates the results of analyses of twelve samples of cloves, which may be briefly given here in maximum, minimum and mean figures, leaving the details and methods to be consulted in the original.

	Maximum.	Minimum.	Average.
Moisture	8.26 per cent.	7.02 per cent.	7.95 per cent.
Ash	6.94 "	4.20 "	5.45 "
Alcoholic extract	14 90 "	11.55 "	12.79 "
Crude fiber	10.55 "	9.50 "	10.00 "
Nitrogen	0.95 "	0.91 "	0.93 "
(As albuminoids)	6.01 "	5.76 "	5.86 "
Ether extract, total	26.92 "	24.06 "	25.11 "
Ether extract, volatile	20.53 "	17.82 "	18.90 "
Ether extract, non-volatile	6.39 "	6.24 "	6.29 "
Oxygen equivalent	2.03 "	2.20 "	2.55 "
(As quercitannic acid,	20.54 "	17.13 "	18.19 "

In concluding his paper, the author mentions that the three determinations upon which the greatest reliance may be placed are the determinations of ash, nitrogen and the oxygen equivalent. The determination of the ether extract is also advisable, while the other determinations are of doubtful value.—Amer. Journ. Pharm., Jan., 1909, 6–9.

Cloves—Reaction with Ferric Chloride.—E. Spaeth having in his treatise on "Adulterated Spices" (which see) expressed the opinion that the deep-blue color produced by ferric chloride on the tissues of cloves is due to their eugenol content, L. Rosenthaler communicates the details of experiments which demonstrate that the reaction is due wholly or in large part to the tannin-like body contained in the cloves. It is true that an aqueous solution of oil of cloves yields a transient, blue color with ferric

chloride ; but in infusion of cloves gives a deep black-blue color, and precipitates with the same reagent, even after it has been repeatedly shaken out with ether, which would result in the complete removal of the oils, and with it, of course, the eugenol.—Pharm. Zentralh., xlix (1908), No. 33, 647.

Melaleuca Uncinata, R. Br., and M. Nodosa, Sm.—Yield and Characters of Volatile Oils.—R. I. Baker and H. G. Smith, after detailed botanical information on the morphological and anatomical relations of two Australian species of Melaleuca—*M. uncinata* and *M. nodosa*—discusses their volatile-oil content. The leaves and twigs of *M. uncinata* collected in the month of March yielded on distillation 1.246 per cent. of a yellowish oil, containing much *cineol*, a small amount of *d-pinene* (cajuput oil contains *l-pinene*) ; a *sesquiterpene*, and a new crystalline substance, which the authors have named

Uncineol.—This proved to be an alcohol $(C_{10}H_{18}O)_1$, which after repeated purification was snow-white, melted at 72°5′, and dextrogyre, $(a)_D = +36.99°$ in alcoholic solution. It sublimes in needles, and dissolves in acetic acid, chloroform, carbon tetrachloride, alcohol, ether, acetic ether, acetone, and other organic solvents.

Volatile Oil of Melaleuca Uncinata, itself, had the following constants : sp. gr. at 15° C., 0.9257 ; optical rotation $(a)_D = +7.2°$; index of refraction at 15° C. : 1.4788 ; saponification number, 3.05 ; soluble in 1.5 vol. of 70 per cent. (by weight) alcohol. It contains no phellandrene. The

Volatile Oil of Melaleuca Nodosa was obtained from leaves and twigs collected during the middle of June in a yield of 0.664 per cent. The crude oil is bright yellow, has a terebinthinate odor, which is somewhat covered by small quantities of (butylic or valeric) aldehyde, and gave the following constants : Sp. gr. at 15° C., 0.8984 ; optical rotation, $(a)_D = -11.6°$; index of refraction at 18° C., 1.4689 ; saponification number, 7.24 ; soluble in 1 vol. of 80 per cent. (by weight) of alcohol. The oil consists chiefly of *cineol* (33 per cent.) and *d-pinene*, and therefore corresponds more closely to eucalyptus oil than to cajuput oil. Phellandrene could not be detected.—Schimmel's Rep., Nov., 1908, 28–29 ; from Reprint (Part II) Journ. and Proc. Royal Soc. of N. S. Wales, *41*, 196.

Pimenta Acris, var. Citrifolia—A Lemon-scented Bay.—It is not generally known that *Pimenta acris*, the leaves of which are used in the West Indies in the manufacture of "bay rum," has a variety which possesses a lemon-like odor. This plant, which is distinguished as *P. acris*, var. *citrifolia*, or lemon-scented bay, and was noticed by I. H. Hart in the "West Indian Bulletin" some years ago (Vol. III, 172, and Vol. IV, 189), grows, together with the typical form, in the islands of Dominica, Montserrat, Barbuda and Antigua, but in the island of Tortola, where it is also found, the typical form is uncommon. A sample of the oil was found by

the bisulphite method to yield 65 per cent. of citral. Further experiments are recorded with regard to lemon-scented bay leaves obtained from Tortola. These were found to contain 1.11 per cent. of oil of a lemon-like odor, with a secondary odor resembling that of phenyl isocyanide. It had a specific gravity of 0.8937, an optical rotation of —0.16, and contained 4 per cent. of citral and 10 per cent. of phenols, and was completely soluble in alcohol down to 60 per cent. Typical bay leaves also contain some citral, and the phenols recorded as occurring in them are eugenol, methyl eugenol, chavicol and methyl chavicol.—Pharm. Journ., Jan. 2, 1909, 6; from West Ind. Bull., ix, 265–276.

ROSACEÆ.

Cratægus Oxycanthus—Fatal Poisoning with the Fruit.—Greshoff reports two cases of acute poisoning with hawthorn berries, one of them terminating fatally. Two schoolboys, aged respectively 8 and 13 years, picked and ate a quantity of the haws on their way home from school. The younger one quickly became ill and had to be carried home, where he died in two days. The elder boy was taken ill the following day, but ultimately recovered. The only toxic substance known to occur in the berries of *Cratægus oxycanthus* is a trace of prussic acid in the seeds, but the quantity is too small to have a harmful effect, and none occurs in the flesh of the pericarp. These facts point to the probability of some poisonous principle occurring in the fruits, although no previous record of poisoning with them is found in literature.—Apoth. Ztg., xxiv (1909), No. 1, 10; from Pharm. Weekblad, *51* (1908).

Pirus Toringo—Constituents of the Bark and Uses.—Y. Hirase has subjected the bark of *Pirus toringo* to chemical examination. This bark is employed in Japan as the source of a yellow coloring-matter known as "dzumi." For this purpose it is extracted with potassium carbonate and the pigment precipitated with alum. The powdered bark is also used for adulterating powdered licorice, gentian, and other drugs. The alcoholic extract of the bark has yielded a white crystalline glucoside.

Toringin, $C_{21}H_{20}O_9 + 2H_2O$; melting point when hydrated, 135–137° C.; when anhydrous, 240° C. When hydrolysed it furnishes chrysin and a sugar, according to the following equation: $C_{21}H_{20}O_9 + H_2O = C_{15}H_{10}O_4 + C_6H_{12}O_6$. The osazone of the sugar melts at 204° C. From the mother liquor, after separating toringin, pirus-quercitin, $C_{21}H_{20}O_{11}$, occurs in yellow needles, melting-point 174°–176° C. This is hydrolysed into quercetin and rhamnose.—Apoth. Ztg., xxiv (1909), No. 22, 194; from Ber. d. Pharm. Gess. v. Japan, 1909, 1.

LEGUMINOSÆ.

African Ground Nuts—Percentage of Fixed Oil and Proteid Substances.—Hugo Kühl has examined ground nuts (the seeds of *Arachis hypogæa*)

from the German African colonies and found them to contain on an average 48.86 per cent. of fixed oil and 5.18 per cent. of nitrogen, corresponding to 32.41 per cent. of protein substances.—Pharm. Ztg., liv (1909), No. 6, 58.

Balsam of Peru—Method of Examination.—Th. Delphin recommends the following systematic method for the examination of balsam of Peru, which he has found to yield reliable data for the recognition of the pure balsam. The synthetic substitutes for pure balsam can, however, be differentiated only by the physical properties of the resin-ester, which differ from those of the resin ester of the natural product. The balsam under examination is dissolved in ether, the solution filtered and the residue washed, dried and weighed: = *Portion insoluble in ether.* The ethereal solution is shaken with $\frac{N}{10}$ potassium hydroxide solution, and after separating the liquids, again shaken out with a few cubic centimeters of water. The united aqueous solutions are treated with sodium bicarbonate and a current of carbon dioxide is passed through the mixture; the resulting precipitate, washed with warm water, dried and weighed: = *Resin-ester.* The filtrate and washings are treated with hydrochloric acid; after effervescence ceases the precipitate is collected on a filter, washed with boiling water, dried and weighed: = *Resin Acid.* The filtrate and washings from this are then shaken out with ether and the united ethereal solution titrated with $\frac{N}{10}$ potassium hydroxide solution, using phenolphthalein as indicator: = *Aromatic acids, calculated as cinnamic acid.* The (original) ether solution, remaining after shaking with $\frac{N}{10}$ potassium hydroxide solution, is evaporated on the water-bath, the residue heated during half an hour, allowed to stand in the exsiccator 12–18 hours, and weighed: = *Cinnamein.* The saponification number of the cinnamein is determined with the aid of $\frac{N}{10}$ alcoholic potassium hydroxide solution by Thoms's method. The cinnamein should form a clear solution with alcohol: *Absence of fixed oils*, except *ricinus oil.* The absence of the latter is shown by neutralizing the solution of the saponified cinnamein, evaporating the alcohol and, after twice shaking it with ether, dissolving the residue in water. The solution should not become more than opalescent on addition of potassium chloride solution. —Pharm. Ztg., liii (1908), No. 93 and 95, 922; from Sveresk. farmaceut. tidskrift, 1907, Nos. 22–24.

Balsam of Peru—Soluble Preparation with Formaldehyde.—O. Boerner, under a German patent, obtains a soluble preparation of balsam of Peru with formaldehyde, which possesses the antiseptic and healing properties of the balsam as well as the valuable properties of the formaldehyde, without the harmful action of the latter on mucous membranes. It is prepared by mixing 100 Gm. of the balsam with a solution of 20 Gm. of potassium hydroxide in 80 Gm. of 90 per cent. alcohol and 20 Gm. of water; a cur-

rent of gaseous formaldehyde is then passed into the mixture, warmed at about 60° C., until saturated, and the whole is warmed until the mixture is found to form a clear solution with water.—Chem. Ztg., May 18, 1909, 270.

Balsam of Tolu—Reliable Test for Rosin—According to Perrot and Goris the presence of colophonium in balsam of tolu is reliably determined as follows: 5 Gm. of the balsam are extracted with 30 Cc. of carbon disulphide, the solution evaporated, the residue dissolved in 10 Cc. of petroleum ether, and the solution filtered. On adding solution of cupric acetate (1 : 1000) to the filtrate, this assumes a green color if rosin is present in the sample. The method proposed is a modification of that directed in the Pharm. Helvet., but has the advantage of greater delicacy, permitting the reliable determination of 4 per cent. of colophonium in the balsam.—Pharm. Ztg., liv (1909), No. 4, 38; from Bull. de Sc. Pharmacol., 1908, No. 11.

Tolu—Modification of the Ph. Helv. Method for the Detection of Rosin.—E. Perrot and A. Goris recommend the following method for the detection of rosin in tolu balsam: Five Gm. of the balsam is shaken with 30 Cc. of carbon disulphide, either in the cold or by gentle heat. The liquid is decanted, evaporated to dryness, the dry residue treated with 10 Cc. of petroleum ether, the solution filtered, and the filtrate treated with a 1 :1000 solution of copper acetate. The presence of rosin is indicated by the production of a green color, due to abietinic acid. This method is more sensitive than that official in the Swiss Pharmacopœia, in which the copper acetate reagent is employed directly with the petroleum ether extract of the balsam. The test is not available for Peruvian balsam; that drug when pure, and treated as above gives a green color, resembling the reaction of abietinic acid.—Apoth. Ztg., xxiv (1909), No. 1, 9; from Bull. d. Sc. Pharmacology, 1908, 636.

Copaibas and Copaiba Oils—Comprehensive Review.—Eibner contributes a comprehensive report in which he enumerates and reviews the characters of distinction of the known sorts of genuine copaibas and copaiba oils, their sophistications and substitutes. He discusses the technical methods of testing the copaibas (acid, saponification and ester numbers), their relation to solvents, the ammonia test for the presence of colophonium or turpentine, etc. Further, the statements concerning the physical constants—specific gravity, boiling point, optical rotation, indices of refraction—and the chemical properties of the copaiba oils are very thoroughly discussed in this interesting paper, which may be consulted in Farben-Zeitung, 13 (1908), 1627.

African Copaiba and its Oil—Properties, Constants, Etc.—Schimmel & Co. describe a small parcel of African copaiba, a variety which has frequently been used as an adulterant of West Indian copaibas. It had a

dark brown color with a distinct green fluorescence, a very faint odor, differing distinctly from that of other copaibas, and gave the following constants: Sp. gr. at 15° C., 0.9919; opt. rotation, = —2° 15′; acid number, 61.4; saponification number, 68.5; ester number, 7.1; not completely soluble in 98 per cent. alcohol. The

Volatile Oil of this African Copaiba was obtained by steam distillation to the amount of 46.5 per cent. It was colorless, dextrogyre $(a)_D = +22° 26′$), had the sp. gr. at 15° C. of 0.9215; acid number, 2.2; ester number, 0; soluble with opalescence in 10 vol. 95 per cent. alcohol, and clear in 2 vol. 98 per cent. alcohol, but became faintly opalescent when more was added.—Schimmel's Rep., Nov., 1908, 48.

Chuntschir—An Asiatic Variety of Licorice Root.—S. G. Kowalejew has made a comparative pharmacognostic and chemical examination of "chuntschir," an Asiatic variety of licorice root, and other commercial sorts of licorice root, which lead him to the following conclusions: The mother-plant of chuntschir is a special variety,

Glycyrrhiza Uralensis, Fisch., which was discovered by Helm in the Siberian Ural, in 1825, and described by De Candolle. Its habitat is quite extended, comprising southwestern Siberia, the salt-steppes of Central Asia, Russian and Chinese Turkestan, southern Mongolia and northern Tibet. In quality, chuntschir is superior to good Spanish licorice root, and scarcely inferior to the best sorts of Russian roots. Characteristic pharmacognostic peculiarities are the more or less contorted medullary rays. The vessels of the ligneous elements have, in comparison with the Russian drug, thinner walls and smaller side-walls. The roots collected in autumn contain more glycyrrhizic acid than those collected in summer, and are characterized by floating on water, whereas summer roots will sink. The quantitative estimation, which is best made by the method of Hafner, yielded, with careful observance of identical conditions, the following percentages of glycyrrhizic acid: Chuntschir, 17.83–19.44 per cent.; Russian licorice root, 20.26–20.82 per cent.; Spanish licorice root, 18.21 per cent. The content of glycyrrhizic acid appears to bear some relation to the starch content, since roots containing little starch contained correspondingly smaller amounts of the acid. The extracts prepared from chuntschir are pronounced by the author as superior in appearance to either those from Russian or from Spanish roots, the chuntschir extracts being more transparent.—Pharm. Ztg., liv (1909), No. 8, 78; from Pharm. Journ. (russ.), 1908, 1063.

Licorice Root—Collection and Preparation for Market in Asiatic Turkey.—U. S. Consul E. L. Harris, of Smyrna, gives some interesting information concerning the licorice root industry in Asiatic Turkey, from whence about 14,210 tons are annually exported to the United States. He says that licorice root grows wild in the fields of Asia Minor, and few

attempts have been made thus far toward its cultivation. It grows chiefly in the Meander and Hermus valleys, and until fifty years ago was practically unused. The root grown on the Meander plains is the best in the world, being superior to that found in Syria, Mesopotamia, Caucasia, Siberia or China. The exporters of the root lease licorice-bearing lands for a period of from three to five years. Digging usually begins in October, and is done by peasants, who at the end of each day deliver the root to the various depots and receive payment according to the quantity they bring. The root is piled up and exposed to the air until about May and June. It then weighs only half as much as originally, owing to the thorough drying process to which it has been subjected. The root is sorted to obtain the qualities known as "debris" and "bagette," both of which are highly valued, but the quantity and consumption of these two qualities is small compared with the unsorted root exported for the purpose of manufacture. Licorice root is shipped in bales weighing about 220 pounds each, pressed by hydraulic machinery and strapped with iron bands. The United States is the principal consumer of the unsorted kind, while the "debris" and "bagette" qualities are purchased almost exclusively by France, being shipped in sacks weighing 300 to 330 pounds each.—Meyer Bros.' Drugg., May, 1909, 144.

Indian Kinos—New Varieties.—David Hooper states that three astringent plant juices have been received at the Indian Museum during the past year for examination and report, which were respectively derived from: *Jatropha curcas*, from South Salem; *Xylia dolabriformis*, from Burma; and *Parkia insignis* ("Myauk-ta-nyet"), also from Burma. When evaporated to dryness, these liquids left dark red-colored extracts responding to the tests for tannin. The three secretions must, therefore, be added to the class of astringent gums designated as kinos.—Pharm. Journ., Aug. 8, 1908, 161.

Moringa Pterygosperma—Formation of Gum.—F. Jadin and V. Boucher have studied pathology of gum formation in *Moringa pterygosperma*, which they explain thus: The pith of this plant contains a central, small, tubular lacuna filled with gum produced by the swelling, and finally total transformation into gum, of the walls of some of the cells; this gum is, however, never exuded. The exudation of the gum, which is often observed on the stem and branches, is the result of injury, and the gum is therefore of pathological origin. The walls of several contiguous cells first swell, and are then rapidly transformed into gum which fills the cavity thus produced; the gummosis extends then to other adjoining cells, and so a large cavity is formed. These cavities are situated near the internal margin of the pericycle, and between two medullary rays; none are formed in the wood. They are axially elongated and interrupted at intervals by normal cells. In the parenchymatous tissue of the cortex and pericycle

are numerous cells containing ferments (emulsin and myrosin). The gum that is formed is discharged on to the surface of the organ producing it. By suitable staining it can be shown that cell-walls of all the tissues excepting those which are lignified or suberised exhibit the first stage of gummosis; the progress of this change gives rise to a normal gum-duct in the pith or to pathological ducts in the bast, in the latter case as the result of injury.—Pharm. Journ., March 27, 1909, 424; from Bull. des Sci. Pharm., *15*, (1908), 247.

Sudan Gums—Source and Method of Collection.—In a third report of the Wellcome Research Laboratories at the Gordon Memorial College, Khartoum, some new facts and details concerning the production and collection of gums in the Sudan are given, from which it appears that the principal Sudan gum exported is that from *Acacia verek*, which grows chiefly in the barren sandy soil of the Kordofan province, and is locally known as "hashab." This species is said to be identical with *Acacia senegal*, Willd (which yields Senegal gum). Probably no Sudan industry is more poorly paid than that of gum collection, which is a secondary matter until after the harvest has been garnered. In consequence, the trees, which are ready for tapping early in the autumn, after the cessation of the rains, are tapped later, so that the season of exudation, which ends in May, has only a duration of four months. This delay may possibly affect the quality and quanity of gum. Geneinas (gardens) yield almost the whole of the commercial gum from tapped trees, "wady" (wild) or naturally exuded gum forming but a small proportion of the "hashab." As the collectors are forced to carry their own food, water, and the gum, which they collect during the driest season of the year, only geneinas situated within a reasonable distance of the very small number of wells which exist in the Kordofan district are operated with ease. Those further away are only incompletely worked with great difficulty, and the collectors do not go further than necessity compels them. The tapping is performed by cutting the bark with a small axe and tearing off a thin strip 2 ft. to 3 ft. long and 1 in. to 3 in. wide. The incision should not penetrate into the wood, a thin strip of the inner bark being left to cover it. With the usual methods the tree will not stand tapping oftener than once every alternate year, and experiments show a much better yield with the ordinary mode of tapping than when numerous cuts or shorter strips are made. Trees artificially inoculated by rubbing a moist rag over the bark and then into new gashes gave a much decreased yield of gum, while cold at the time of tapping also has a great retarding effect on gum production. Experimental tappings in three gardens on various-size trees between February and May inclusive, and the exudations collected at intervals of one to three weeks, show that as the season advances the proportion of harder glass-like gum produced varies considerably and increases markedly towards the end. However, the harder gum was not the hard strong gum

(Khartoum gum) of high viscosity strength, formerly picked from Sudan mixed gum. The harder tears, especially those of the earlier collections, as also the whole of the gum, although apparently dissolving in weak solutions (5 to 10 per cent.), in higher concentration yield a glairy mucus-like liquid, from which separates a solution of lower viscosity. On storing, an alteration occurs usually at the end of three or four months, the gum becoming perfectly soluble even in the highest concentrations. Senegal gum may exhibit the same phenomena, one sample requiring two years to become completely soluble. The solubility and viscosity of gums should accordingly be always determined in at least a 20 per cent. solution. The gum from the older trees exhibited a slightly higher strength than that from younger trees, which is contrary to the statements of gum collectors. At the same time, no hard strong gums were found in any of the collections. Its absence, however, may be explained variously —by local conditions as to soil, height of water table, etc. It is exuded (1) only when tapping is performed immediately after the rains had ceased, or (2) in certain years under appropriate conditions of temperature and rainfall. As regards these conditions, "hashab" trees well supplied with water during the drier season fail to produce gum, while the gum dealers state that the hard strong gums come to them in far larger quantity during November and December. Instructions for tapping trees experimented on in October had been given, but through a misunderstanding they were not carried out.—Chem. and Drugg., April 24, 1909, 652.

Tragacanth—Practical Test for Adulterants.—In a paper on "Spurious Gum Tragacanth," Professor Scoville points out that the most commonly used adulterant for tragacanth is known commercially as Indian gum, two kinds of which exist, the one derived from *Sterculia urens*, the other from *Cochlospermum gossypium*. The author gives a tabular view of the more important tests by which those gums may be distinguished from tragacanth, which presents no difficulties when the tests are applied to the pure gums. The appearance and consistency of the solutions is itself sufficient, that of tragacanth being opaque and slimy, while the Indian gum produces a transparent, non-adhesive jelly. Moreover, there are a number of distinctive tests by which the tragacanth may be recognized, while with the Indian gum the distinctive tests are confined, so far as its detection in mixtures is concerned, to its acid reaction and the peculiar action of borax. The reaction with borax is characteristic of gelose, and while not a specific for Indian gum, it is reliable as a test for adulteration in tragacanth, with the probabilities strongly pointing to Indian gum in such a combination.

The test may be carried out as follows: Two grams of gum are shaken with 100 Cc. (mils) of cold water until thoroughly swollen and free from lumps. (If the gum is in powder form, solution is hastened by first wetting it thoroughly with 3 Cc. [mils] of alcohol, then pouring on the water

quickly). Two grams of powdered borax are then added and the mixture shaken until the borax is dissolved. The mixture is now allowed to stand over night. The tragacanth mucilage will then show no change in consistency or appearance beyond a slight darkening in color. The Indian gum mucilage will have lost its transparency and become slimy. On pouring it out of its container it strings out very markedly. If two or three drops be manipulated between the thumb and forefinger, strings several inches long will be easily obtained. A mixture of 5 per cent. of Indian gum with 95 per cent. of tragacanth will form a string one-quarter to one-half inch in length when tested in this way, in a 2 per cent. solution.

Tragacanth mucilage shows none of this stringy or tacky tendency until after it has stood in borax solution several days. Even on prolonged standing this sliminess is much less marked. For the detection of Indian gum, which may be present in small proportions only, the test should be made within thirty-six hours after adding the borax. Drugg. Circ., March, 1909, 116–117.

Tragacanth—Insufficiency of the Official Tests for the Powdered Drug.—Prof. Joseph Feil states that the pharmacopœial tests are not as fully complete for the powdered tragacanth as they are for the whole drug. For instance, the color produced with sodium hydroxide solution should be described as bright greenish-yellow, not yellow, as a fairly adulterated article gives the latter and not the former coloration, which is the tint of good tragacanth. Then, the statement that the fluid portion gives a precipitate by addition of alcohol, should be changed so as to read, "When alcohol is added to the fluid portion a precipitate occurs, and if added until no further precipitate appears and the liquid is filtered, the filtrate should leave only a very small or no residue on evaporation. To the statement that fifty parts of water gives a cloudy, gelatinous mass should be followed by, "which is firm enough so that when the vessel is inverted it will not flow." Professor Feil exhibited specimens producing solid, half-solid, gum-arabic-like, one-fourth solid, and three-fourths solid mucilages, as good representative qualities of the commercial powder, which in the order named were insoluble, partly soluble, soluble, partly soluble and slightly soluble, in alcohol. These variations and defects are due to two causes—the use of inferior qualities of tragacanth and the designed sophistication—the latter being evidenced by the astonishing solubility in alcohol, which must be ascribed to the use of the varieties of gum known as "sarcocolla," a substance used in medicine from the earliest times. This substance is said to be obtained from various species of *Penaca*, growing in Central and Southern Africa, but Dr. Dymock states that at least one variety used in Central Africa is derived from a Persian species of *Astragalus*.—Proc. Ohio State Pharm. Assoc., 1908, 63–65.

Tragacanth—Fallacy of the Iodine Test for Starch.—H. Runne remarks that nearly all European Pharmacopœias, as well as that of the U. S., provide that the filtrate obtained from a suitable dilution of tragacanth mucilage (1 : 50 or 100, further diluted usually with 10 times the volume of water) should not be blued by iodine water, while the residue on the filter will give a distinctly blue or blue-black color. His experiments, however, demonstrate that pure tragacanth contains so little starch, that even $\frac{N}{10}$ iodine solution does not produce a blue color with the filter-residue that is visible to the naked eye. Moreover, if to the pure tragacanth as much as 10 per cent. of starch paste, *previously evaporated to dryness and powdered*, is added, and the so adulterated tragacanth is tested by the pharmacopœial method, *the filtrate is not turned blue* by iodine. This is due to the fact that the dried starch paste is not dissolved under the conditions of the test. The filter residue, on the other hand, will give a blue-black color with $\frac{N}{10}$ iodine solution, and when this occurs in the examination of a sample of tragacanth, it must be regarded as being adulterated with starch. The author, however, recommends the microscopic examination as being more reliable, both for adulterations with starch and with dextrin. *Regarding the adulteration of tragacanth with gum arabic*, the author finds the guaiacum reaction available, since acacia gum contains an oxydase which produces the well-known blue coloration with tincture of guaiac, while pure tragacanth, which is free from the oxydase, never gives this reaction. Nevertheless, the absence of the guaiac reaction is not necessarily indicative of the absence of acacia gum, since, as demonstrated by the author experimentally, the oxydase in the gum arabic may be destroyed and rendered inactive when the drug is heated to 120° C.—Apoth. Ztg., xxiv (1909), No. 43, 389–391.

TEREBINTHACEÆ.

Cachon Nuts—Composition of the Kernels.—Dr. Wilh. Theopold discusses the possible value of the so-called "cachon," or "acajon nuts" (the seeds of *Anacardia occidentale*, L.), as a substitute for almonds, walnuts, etc., in confectionary and as a nutrient. These seeds have a hard pericarp, enclosing a kernel of about the size of almonds, and have an agreeable, mild almond-like taste. Two samples examined had the following composition: Fixed oil (petroleum ether extract), 47.15 per cent.; ether extract, 0.4 per cent.; alcohol extract, 7.2 per cent.; reducing substances, 8.1 per cent.; nitrogenous substances, 9.7 per cent.; starch, 8.9 per cent.; loss in drying, 3.8 per cent. The following constants were determined in the fixed oils from the two examples: Iodine number, 97.0 and 83.6; saponification number, 182.0 and 187.0; refraction at 25°, 58.8 and 58.1 respectively. The fruits of *Anacardium orientale* contain a smaller seed, which is, however, less agreeable in taste. It also contains oil and starch in abundance.—Pharm. Zentralh., xlix (1908), 1057–1058.

African Elemis — Chemical Examination.—Two samples of *South Nigeria elemi* have been examined at the Imperial Institute. These gave respectively the following figures: Ash, 0.6 and 0.53 per cent.; acid value, 55.3 and 37.8 per cent.; saponification value, 71.9 and 46.3 per cent.; volatile oil, 8.1 and 4.4 per cent.; both were completely soluble in benzene and turpentine oil, slowly in the latter; sparingly soluble in cold alcohol. The essential oil from one of these was pale yellow in color; specific gravity, 0.8686; $[\alpha]_D$ +50° 30′, and contained a large amount of phellandrene. A specimen of *Uganda elemi* has the following characters: Ash, 0.3 per cent.; volatile oil, 11.2 per cent.; acid value, 29.4 per cent.; saponification value, 44.8 per cent. The oil containing much phellandrene had the specific gravity, 0.8451, and the $[\alpha]_D$ +79° 20′. The elemi was sparingly soluble in cold alcohol; incompletely dissolved by turpentine oil; readily soluble in benzene and in mixtures of that solvent with alcohol; also in a mixture of turpentine oil and alcohol. These African elemis resemble the Manila product in general characters, but contain less essential oil.—Pharm. Journ., Jan. 9, 1909, 32; from Bull. Imp. Inst., *6* (1908), 252.

"Gharu" or "Gaharu"—A Perfume Wood from Sumatra.—According to Moszkowski the so-called "gharu" or "gaharu" (Adlerholz = Eaglewood), a perfume wood from Sumatra, is found in the interior of the karas tree, a species of *Aquilaria*. The karas tree is a handsome tree, frequently 40 meters in height, having a smooth, gray bark and a magnificent umbrella-shaped crown. The valuable perfume wood is, however, not found in all the trees, but only in a small proportion of them, being probably a product of disease in the region of the sieve tubes, as conjectured by Crawford. A single tree may yield up to 240 Kgm. of this perfume wood.—Pharm. Ztg., liii (1908), No. 83, 815; from Notizbl. d. Kgl. botan. Gart. in Dahlem, v, No. 243.

Japan Wax—Method of Bleaching, Etc.—According to the investigations of Dr. G. Weigel, Japan wax is bleached by natural and not by chemical agencies. The crude wax is boiled and while liquid poured into water; it is then exposed to the direct action of the sunlight 3 to 5 weeks during the summer months, 7 to 8 weeks in winter. This is a matter of some importance, since the naturally bleached article is admitted (into Germany?) free of duty, whereas a duty is imposed on the product bleached by chemical agents. The author also directs attention to a recent importation of

Japan Wax from China, where the varieties of Rhus yielding this vegetable fat are also indigenous. The Chinese article possessed essentially the same characters as the Japanese article, differing very slightly only in the melting-point. It was perfectly white, and gave the following constants: M. p., 49° C. (Japanese wax = 52°–54°); saponification number, 222.4; iodine number, 12.1.—Pharm. Zentralh., xlix (1908), No. 45, 917.

Rhus Toxicodendron—Distinction from the Harmless Ampelopsis Species.—In consequence of the wide-spread opinion of a medical man through the English newspapers that it is advisable for the owners and others to destroy all ornamental plants resembling the poisonous *Rhus toxicodendron*, E. M. Holmes publishes a comparative description of this plant and of the species of the harmless *Ampelopsis* (*A. veitchii* and *A. Hoggii*), which are popularly used as ornamental plants and liable to be confounded with the poisonous *Rhus*. He says there are three forms of *Ampelopsis* in cultivation, *all of which have tendrils*, viz., the common Virginian creeper, *Ampelopsis quinquefolia*, which has five distinct, broadly lanceolate leaflets at the end of a long leaf-stalk, and opposite most of the leaves a long branched tendril is given off. In *Ampelopsis veitchii* (also named *A. tricuspidata*), the leaves do not form separate leaflets, but the larger leaves have three pointed lobes, the leaf-stalk is quite short, the tendrils are branched, but quite short, and adhere firmly to the wall. The third species, evidently a hybrid of the other two species, was introduced some years ago under the name of *Ampelopsis hoggii*. This plant has longer leaf stalks and larger leaves than *A. veitchii*, and short, strongly adhering tendrils, so that it covers the walls with a uniform ivy-like clothing of green, and is not dislodged by strong winds as the ordinary Virginia creeper frequently is. *A. hoggii*, possessing the advantages of both species and the disadvantages of neither, has consequently become a favorite, and owing to the fact that the lower leaves consist of three separate leaflets, *with short equal leaf stalks* (and notwithstanding that the upper leaves are only three-lobed), this peculiarity of the lower leaves has evidently led to *Rhus toxicodendron* being confused with it and sold by nursery men under the name of *Ampelopsis hoggii:*

The creeper on the walls of gardens that has three leaflets, with *stalks of equal length*, or only three lobes, *and that has tendrils*, may be regarded as perfectly safe, for *Rhus toxicodendron never has tendrils, and the terminal leaflet always has a longer stalk than the two side leaflets*, and by these features, which are shown in photographic illustrations, it is easily distinguished.—Pharm. Journ., Aug. 22, 1908, 231–232.

Walnuts—Oil and Proteid Content.—German and French walnuts, the seeds of *Juglans regia*, have been subjected to chemical examination by Hugo Kühl. The German nuts contained on the average 56.76 per cent. of oil and 3.12 per cent. of nitrogen, corresponding to 19.49 per cent. of protein; the French nuts contained 60.71 per cent. of oil and 2.82 per cent. of nitrogen, corresponding to 17.63 per cent. of protein. The latter, a hard-shelled nut, is superior in appearance to the cheaper, soft-shelled German walnuts, the kernels of which are not infrequently mouldy.—Pharm. Ztg., liv (1909), No. 6, 58.

PIPERACEÆ.

Kawa Root—Proximate Constituents.—E. Winzheimer has made a comprehensive study of the proximate constituents of the root of *Piper methysticum* (kawa root), and finds it to contain, besides water, gum, starch, cellulose and inorganic salts, 5.3 per cent. resins (composed of 23 per cent. resin acids and 77 per cent. resenes), 0.30 per cent. methysticin, 0.268 per cent. x-methysticin, 0.184 per cent. yangonin, 0.022 per cent. alkaloid, 0.69 per cent. glucosides (two), some free sugar, 0.7 to 0.8 per cent. of an amorphous acid insoluble in water. Both methysticin and x-methysticin are the esters of methysticinic acid, while yangonin is a lactone of the formula $C_{15}H_{14}O_4$.—Arch. d. Pharm., *246*, No. 5 (July 24, 1908), 338–365.

Matico Leaves—Variability of Commercial Supply and Examination of Several Types.—In a paper read before the International Congress of Applied Chemistry, Prof H. Thoms says that nowadays one seldom finds *Piper angustifolium*, Ruiz and Pavon, in a pure unadulterated condition. The yields of oil from the leaves range from 0.3 to 4 per cent., and the properties of the oils vary greatly. The crystalline matico camphor which used to be found thirty years ago in matico oils is never found now. Petersilienapiol, dillapiol, and asarone are present in addition to terpenes, sesquiterpenes, and cineol in matico oils. Professors Gilg, of Berlin, and De Candolle, of Geneva, assisted Professor Thoms in identifying the leaves which were used for examination. A supply of leaves was, for example, obtained from Huanuco in January, 1908. Usually matico leaves come from Southern Peru. This consignment contained to the extent of only three-quarters of its bulk *Piper lineatum*, while the remaining quarter could not be identified with any known member of the *Piperaceæ*. The oil obtained by distillation (0.59 per cent.) gave a crystalline body which was a mixture of Japan camphor and borneol. A further supply of the leaves contained a much smaller proportion of *Piper lineatum* and a larger proportion of *Piper camphoriferum*, the named coined by De Candolle to indicate the camphor-producer. There was a further leaf present, identified as *Piper angustifolium*, var. *Ossanum*. The three types of the leaves were distilled separately.

Piper camphoriferum, De Candolle. The yield from this was 1.11 per cent. sp. gr. 0.9500 at 20° C. $(a)_D = +19° 21'$. A crystalline body was obtained from the oil consisting of two parts camphor and one part borneol. Terpenes and a sesquiterpene alcohol were also obtained in addition to the camphor.

Piper lineatum, Ruiz and Pavon. The yield of oil from this leaf was 0.44 per cent. $(a)_D = +8° 45'$. Sp. gr. 0.958. The oil contains no camphor, but large quantities of sesquiterpenes. There was insufficient material to go very deeply into the chemistry of this specimen.

Piper angustifolium var. *Ossanum*, De Candolle. Leaves very rough, on the inside long white hairs. Yield of oil, 0.87 per cent. A camphor mixture was also obtained on distillation.

Professor Thoms gives a description of matico oils from other species, such as *P. acutifolium*, *P. mollicomum*, *P. asperifolium*, and certain varieties of them, obtained from various sources, and emphasizes the necessity of the co-operation between botanists and chemists in research work of this nature.—Chem. & Drugg., June 5, 1909, 873.

RHAMNACEÆ.

Rhamnus Cathartica—Constituents of the Fruits.—In the course of an investigation of the constituents of *Rhamnus cathartica*, published in 1900 (see Proceedings, 1901, 741), Tschirch and Polacco arrived at the conclusion that buckthorn berries contain certain yellow coloring matters which are not present in the fruits of other species of *Rhamnus*. They also found small quantities of emodin, and expressed the opinion that the purgative action of the fruits of *R. cathartica* is due to the coloring matters and not to the glucosides split from the emodin, which is readily converted into nigrin. The investigations of N. Waljaschko and N. Krassowski now demonstrate that the fruits of *R. cathartica* contain the same yellow coloring matters as are contained in the fruits of *R. infectoria* and *R. tinctoria*, namely, "quercetin" and "rhamnin," both of these existing in *R. cathartica* in form of glucosides, which are split up by the action of an enzyme contained in the fruits—rhamnin, for example, from the glucoside "xanthorhamnin." The yellow coloring matters of Tschirch and Polacco, therefore, cannot be regarded as pure substances; but the present authors have extended the investigations of the former concerning the purgative substances contained in the buckthorn fruits, with results confirming the theory advanced by Tschirch. They found the fruits to contain about 2 per cent. of emodin-substances, from which they have separated the following new bodies: *Emodin-autranol* ($C_{15}H_{12}O_4$), its glucoside, *Gesterin* ($C_{26}H_{30}O_{13} + \frac{1}{2}H_2O$), and *Rhamno-cathartin* ($C_{27}H_{30}O_{13} + \frac{1}{2}H_2O$), a glucoside of emodin. Furthermore, as cleavage products of the glucosides obtained by the action of ferments from the emodin-substances: *Emodin*, identical with "frangula emodin" and "rhamnosid"; the *emodin of rhamnoxanthin* ($C_{21}H_{20}O_9 + H_2O$), which is isomeric but not identical with "frangulin"; *Rhamnonigrin*, and a *resin-like body* containing emodin. Other constituents found in buckthorn berries are: fixed oil, succinic acid, glucose, galactose, rhamnose, and a pentose (arabinose?); but of the four sugars only glucose was present in the free state, the others being derived from the glucosides.—Pharm. Ztg., liv (1909), No. 16, 159; from Jour. d. russ. phys.-chem. Ges., 1908, 1502.

EUPHORBIACEÆ.

Aleuritis Cordata—Examination of the Fixed Oil from the Seeds.—The seeds of *Aleuritis cordata* contain about 53 per cent. of fixed oil, which is known in commerce as "tung oil." A. Ratji has examined two specimens of this oil, the one of Chinese, the other of Japanese origin, with the following results respectively: Specific gravities, 0.9383 and 0.9393; indices of refraction, 1,503 and 1,504; saponification values, 191.5 and 189.9; acid values, 10.4 and 2.1; ester values, 181.1 and 187.4; iodine values, 156.2 and 153.2; Reichert-Meissl values, 1.04 and 0.55; Hehner values, 96.05 and 96.48; acetyl values, 14.05 and 16.75; true acetyl values, 10.5 and 13.42; glycerin, 10.45 and 9.81 per cent.; unsaponifiable matter, 0.45 and 0.48 per cent. The separated fatty acids had the melting-points 39° to 40° and 40° to 41° C.; saponification values, 189.4 and 188.4; mean molecular weights, 296.5 and 298.7; iodine values, 163.4 and 160.3. They both consisted of 75 per cent. of elæomargarinic acid and oleic acid 25 per cent.—Arch. d. Pharm., *246* (1908), No. 9, 706–709.

Balata—Character of the Phytosterins Present.—Several years ago Tschirch and Schereschewski isolated from "balata" (a product intermediate between caoutchouc and gutta-percha) two crystallizable bodies, which they named respectively *a balalban* and *β-balalban* (see Proceedings, 1905, 750). It was subsequently found that *a balalban* is identical with *β-amyrinacetate*, a phytosterin which N. H. Cohen has since found to be widely distributed in plants, along with another phytosterin, *lupeol*. The author has now isolated from balata gum, in addition to the *β-amyrinacetate* (= *a-balalban*), two other phytosterins, the one identical with the *β-balalban* of Tschirch and Schereschewski, the other consisting of *lupeol*.—Arch. d. Pharm., *246* (1908), No. 7, 510–514.

African Rubber—Character of Phytosterin Present.—N. H. Cohen has subjected a South African "Euphorbia Rubber" to chemical investigation, with particular reference to the crystalline constituents of the resin. He found the sample to contain 5.5 per cent. of pure caoutchouc, 70.0 per cent. resin, 1.7 per cent. impurities, and 25.4 per cent. water. The resin evidently contained, besides β-amyrinacetate (see "Balata"), a second phytosterin, which was, however, not obtained sufficiently pure for identification, but which probably is a mixture of two bodies. Tests made for the presence of lupeol resulted in the negative.—Arch. d. Pharm., *246* (1908), No. 7, 515–520.

In a second paper Mr. Cohen announces that the second phytosterin in the resin from African euphorbia rubber has been compared with authentic specimens of *isocholestrin*, obtained from Dr. A. Schulze, of Zurich, and found to be identical in all respects with that of phytosterin.—Ibid., No. 8, 592–593.

Karite-Guttapercha—Composition and Relative Values.—Mannich and Herzog have made a proximate analysis of the so-called "Karite-Gutta," a product obtained from *Butyrosperum parkii*, and found it to contain, besides 4.85 per cent. of mechanical impurities and 10.5 per cent. of water, 66.2 per cent. of resin and 24 per cent. of a caontchouc-like substance. This variety of "gutta" cannot therefore be regarded as a good substitute for gutta-percha, but is nevertheless not an entirely worthless product.—Pharm. Ztg., liii (1908), No. 64, 627; from Arb. a. d. Pharm. Inst. d. Univ. Berlin, v, 278.

Chrozophora Verbascifolia, Willd.—Yield, Properties and Economic Uses of the Oil of the Seeds.—David Hooper mentions that the seeds of *Chrozophora verbascifolia*, Willd., called "Tannoom," yield an oil which is said to be employed by the Bedouins of Arabia as a substitute for ghee, or clarified butter. The sample was received from the political agent, Koweit, on the Persian Gulf, who stated that the oil had appeared as a new article in the market. The seeds yield about 35 per cent. of a rather thick, yellowish drying oil. A preliminary examination of a small sample showed the following constants: Acid value 3.3, saponification value 200.2, iodine value 137, melting-point of fatty acids 30.5° C.—Pharm. Journ., Aug. 8, 1908, 161.

Euphorbia Pilulifera—Chemical Examination and Physiological Action.—J. Lunn says that *Euphorbia pilulifera* is widely distributed over Queensland as a weed in open places in the bush and along railway lines. Its use, as indicated by the common name "Queensland Asthma Plant," led the author to make an inquiry into its chemical constituents, the result of his examination showing the green herb to contain 79 per cent. of moisture, 18 per cent. of vegetable matter, 0.1 per cent. of an alkaloid, and 0.4 per cent. of a glucosidal body, the last two possibly the active components of the plant. On incineration of the dried herb, it yielded 3 per cent. of ash. The reports of the medical authorities who have experimented with the plant point to the fact that it has little or no physiological action.—Pharm. Journ., April 17, 1909, 528; from papers read at Austral. Pharm. Conference.

Euphorbium Peplus—Superiority as an Anti-Asthmatic.—Artault observes that while we have been importing and compounding *Euphorbium pilulifera* as a remedy for asthma, the common weed, indigenous to Europe (and naturalized in the United States? Rep.), is of considerably more value for the purpose. A decoction of 4 or 5 Gm. of the dried herb in 1000 Cc. of water, boiled 15 minutes, strained, and made up to 1 liter, may be prescribed in teacupful doses three or four times a day, with marked effect in relieving dyspnœa of asthma, catarrh and other respiratory troubles. It has no narcotic action, but in larger doses is emetic, irritant and purgative. Both the fresh and dried herb should be carefully

handled, as it may cause an eruption on the face and hands; its dust is very irritant to the nasal membrane and to the conjunctiva.—Pharm. Jour., July 18, 1908, 56; from Nouv. Remédes, *24* (1908), 265.

Purgative Euphorbiaceous Seeds from Trinidad—Characters and Actions.—J. Theodore Cash calls attention to those oil-bearing euphorbiaceous seeds, derived from *Omphalea megacarpa* (or *diandra*), from *Omphalea triandra* and from *Garcia nutans*, respectively, which in Trinidad have the reputation of laxative action in their fresh state. He gives a brief description of their morphological characters, but deals particularly with the possible pharmacological activity of these seeds, which he believes resides chiefly in the bland fixed oil, present in the following percentages in their endosperms and the whole seed, respectively:

	In the endosperm.	Calculated for the whole seed.
Omphalea megacarpa (diandra) ..	64 per cent.	47.33 per cent.
Omphalea triandra	56.6 "	36.9 "
Garcia nutans	38.29 "	26.0 "

From his experiments the author concludes that the seeds of

Omphalea megacarpa and *O. triandra*, and fixed oils extracted from them, furnish in suitable dosage valuable simple purgatives or laxatives which act with considerable certainty and without concomitant effects of an unpleasant character. They act satisfactorily on repetition, whilst the entire absence of any unpleasant flavor is a very practical advantage. The seed of

Garcia nutans, though it has drastic or laxative properties (according to dosage), which might be utilized in appropriate cases, probably contains a principle (or principles) having a deleterious action, and therefore it must be employed therapeutically with caution. Should the extracted oil be used in place of the seed, its preparation must be conducted so as to ensure the absence of any other principle.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 416–423.

Ricinus Seed Meal—A Nutrient Preparation in India.—David Hooper calls attention to "castor meal," a product submitted by the Director-General of Commercial Intelligence to the Indian Museum for analysis. It was a white, odorless and tasteless powder, said to have been made from castor cake after removal of the oil and the natural toxic property. The meal was exceptionally rich in albuminoids, was free from starch, and would appear to be a suitable food for diabetic subjects.—Pharm. Journ., Aug. 8, 1908, 161.

Japanese Castor Oil—Renewed Interest in its Production.—Several years ago (1904) attention was directed by Dr. G. Weigel to Japanese castor oil as a possible competitor on the world's market, but until re-

cently no further information concerning this commodity has been given out. It is now stated, however, that efforts are being made by several Japanese firms to utilize the *Ricinus* plants, which flourish particularly well in Formosa, and that towards this end the Japanese government also evinces some interest. Two varieties of *Ricinus* are said to come under consideration, one dark green and one red; the seeds of the latter appear to be both larger and richer in oil content.—Pharm. Zentralh., xlix (1908), No. 45, 916.

URTICACEÆ.

Antiaris Toxicaria—Resin in the Latex.—A. Windhaus and A. Welich find that the latex of *Antiaris toxicaria* contains besides the very active glucosidal poison, antiarin, a resinous body which they designate as

Antiaresin. This is insoluble in petroleum ether, but crystallizes from ether and methyl alcohol in form of long, stout needles, having the composition $C_{39}H_{56}O_2$, the molecular weight of 556, and melting-point 176° C. By saponification, *a*-amyrin and cinnamic acid are obtained, proving the antiaresin to be the cinnamic acid ester of these two products. The crude resin also contains other alcohols besides *a*-amyrin, which remain to be isolated. The identity of the *a*-amyrin was obtained producing the acetic-, benzoic-, and cinnamic-acid esters from that isolated from the antiaresin-products of saponification, among which traces of stearic acid were also discovered.—Arch. d. Pharm., *246* (1908), No. 7, 504–508.

Charas of Indian Hemp—Description of Sources, Properties, Constituents and Physiological Value.—David Hooper observes that "charas" has been described as "a foul and crude drug, the use of which is properly excluded from civilized medicine," but that notwithstanding this unfavorable opinion regarding it held in Europe, it is being imported into British India at the rate of £120,000 worth per annum, a cost which exceeds the combined value of other medicinal agents imported by land into that country, and that it is, therefore, an article that deserves more than the passing reference that is given it in most of the published reports on Indian products. The author gives a highly interesting description of the sources of charas, its commerce, varieties, adulteration, characters, chemical composition and physiological value, which may be consulted in Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 435–443.

Indian Hemp—Possible Valuation by the Iodine Number of its Preparations.—David Hooper mentions that since the isolation, in 1896, of a red oil from charas giving rise to all the symptoms of cannabis poisoning, it does not appear that the determination of the value of Indian hemp drugs and their preparations, based on the content of "cannabinol," as this red oil has been called, has been attempted. It has since been demonstrated that the cannabinol is simply the carrier of the active constituent, that all the constituents have not the same activity; that when freshly pre-

pared it may be distinctly active; but that, owing to oxidation, the compound becomes inert. Since, therefore, the deterioration of hemp drugs is caused by oxidation of cannabinol, and probably other more volatile bodies, Mr. Hooper conceived the idea of trying the action of a halogen upon the extracts in order to ascertain, if possible, the extent of oxidation and consequent deterioration, just as, for example, the degree of oxidation is ascertained by the reduction of the iodine number of a linseed oil, which reacts strongly with iodine in a fresh condition, and to a modified extent when the oil has suffered oxidation. With this object a series of iodine values was obtained in various extracts of "charas," "ganja," and "bhang," of which the Indian Museum possesses samples of different ages; and these, ascertained under identical conditions, and different methods after certain preliminary experiments, proved that the iodine value discriminates in a very marked manner between fresh and old samples of the drug. For the details of examination and results the original paper may be consulted in Pharm. Journ., July 25, 1908, 80.

Indian Hemp—Cause of Loss of Activity.—Dr. C. R. Marshall has experimented with the object of ascertaining, if possible, the cause of the loss of activity of Indian hemp and its preparations. His results point out very conclusively that this is due, as was surmised, to oxidation. Cannabinol prepared from a sample of active "charas," was found quite active, and retained its activity when preserved in sealed vials, while the "charas" from which it had been prepared, after storing for some time in a dark store, yielded a cannabinol which was almost inert. Active cannabinol, heated at 150°–160° C., and a current of oxygen passed through it, gradually lost its activity, and when heated thirteen hours longer, the temperature increased at the end to 185° C., to keep it liquid, it became quite inert; but a portion of the same cannabinol, treated simultaneously in the same way with carbon dioxide retained its activity unimpaired. The author concludes, that there is reason to believe that preparations of *Cannabis indica* deteriorate relatively quickly, but that if put up in hermetically sealed vessels, and the vessel re-sealed each time after use, greater uniformity in the action of a particular preparation would be obtained.—Pharm. Journ., March 27, 1909, 418.

CUPULIFERÆ.

Italian Hazel Nuts—Percentages of Fat and Proteids.—Hugo Kühl has determined the fixed oil and nitrogen in two varieties of hazel nuts (the seeds of *Corylus tubulosa*, Wild.), the one the elongated egg-shaped "Giovani" nuts, the other the more globular "Neapolitan" nuts. The first-named sort contained 56.04 per cent. of oil; the second sort, 60.22 per cent.; both sorts contained 2.47 per cent. of nitrogen, corresponding to 15.44 per cent. of proteids. It is noteworthy that the "Giovani" hazel nuts, which contain the more vigorous and fuller kernels, are cheaper

than the inferior "Neapolitan" sort, which are frequently barren.—Pharm. Ztg., liv (1909), No. 6, 58.

CONIFERÆ.

Norway Pine—New Acid in the Resin.—According to G. B. Frankforter, the resin of *Pinus resinosa*, from which the oil of turpentine had been removed by gentle heating *in vacuo*, has furnished a new resin acid, resinic acid, $C_{25}H_{38}O_5$, a distinctly crystalline powder, melting, when pure, at 97°–98° C. It forms unstable ammonium and barium salts, and somewhat resembles the palabienic acid of Tschirch. Besides this, the resin contained abietic acid, which, however, melted at 129°–130° C., or somewhat lower than the melting point recently attributed to that acid.—Journ. Amer. Chem. Soc., *31* (1909), 561.

Grecian Turpentine Oil—An Adulterant of Citrus Oils.—Drs. Berté and Romeo, in their official report on *Citrus oils* to the Messina Chamber of Commerce, say that Grecian turpentine oil, the product of *Pinus halepensis*, is frequently met with as an adulterant, and cannot readily be detected by the usual methods. This oil has the following characters:

Specific gravity at 15° C.	0.8620 to 0.8718.
Optical rotation in 100-Mm. tube	+ 37° 6′ to + 39° 45′.
Refractive index at 15° C.	67° 2′ Zeiss.
Initial boiling-point	155° C.
Fixed residue	2.75 per cent.
Acid value (calculated as acetic acid)	0.17 per cent.
Solubility in 80 per cent. alcohol	1 in 13.7 volumes.

Owing to the difficulty of detecting 5 per cent. of this body in lemon, orange, and bergamot oils by the usual fractionation methods, Drs. Berté and Romeo recommended that the importation of this oil into the lemon-producing provinces should be prohibited by the Government.—Chem. & Drugg., Jan. 16, 1909, 81.

Venice Turpentine—New Method for Detecting Admixture of Ordinary Turpentine.—L. E. Walbrun recommends a new method for the detection of ordinary turpentine in Venice turpentine, which is based on the observation that an ethereal solution of the latter forms a clear solution with ammonia water when made in certain proportions, which in a short time forms a gelatinous mass, whereas ordinary turpentine treated in the same way forms a clear solution which will not gelatinize. Moreover, the presence of ordinary turpentine will retard the gelatinization of the Venice turpentine solution and may, if present in sufficient quantity, prevent gelatinization completely. Turpentine is also an important factor in determining the gelatinizing period. The test is carried out as follows: 10 Gm. of Venice turpentine are dissolved in 30 Gm. of ether, and the well-closed flask is immersed in a water-bath at a temperature of 20.5° C. After 10 minutes' exposure, 8 Cc. of $\frac{N}{2}$ ammonia solution, previously heated to the

same temperature (20.5° C.), are added and the liquids well mixed. A perfectly clear liquid is produced which should congeal to a gelatinous mass within, at most, 11 minutes. If 10 per cent. of ordinary turpentine has been added to the Venice turpentine, the gelatinization does not result before the lapse of 27 minutes, and with larger quantities the gelatinization is retarded so long as to make the further extension of the method impracticable at the specified temperature. The author suggests, however, that by reducing the temperature in such cases (say to 2° or 3° C.) it becomes possible, in the presence of large quantities of adulterant, to correspondingly reduce the time required for gelatinization; but this must be a subject for further investigation and elaboration.—Pharm. Zentralh., xlix (1908), No. 45, 911–914.

MISCELLANEOUS.

Peat—Characters of the Humic Matter and Formation.—L. Roger and E. Vulguin find that when peat is formed nitrogen and carbon accumulate in the degradation products of the plants. Neither pentosans nor hexosans are present in the humic matter. The alcoholic functions of the celluloses seem to persist, as shown by the formation of an acetylated compound and of a compound analogous to the thiocarbonate of cellulose. Several constituents of lignocellulose have been detected, an aromatic C_6 radicle and a secondary acetyl constituent CH_2CO. The unsaturated character of the latter is shown by the fixation of halogens. The humic matter also possesses acid properties.—Chem. News, Jan. 22, 1909, 48; from Compt. rend., *147* (1908), No. 25.

Montan Wax—A Constituent of Peat: Characters.—J. Marcusson describes "montan wax," which is obtained by extracting peat with petroleum spirit or benzene, and is purified by distillation with superheated steam. The purified product, which is used for candles, is not yet commercially important, but the crude wax is largely employed as an insulating material. A sample of the latter examined by Ubbelohde's method became fluid at 83.5° C., and had a dropping-point of 84.3° C. It consisted, in the main, of compounds of high molecular weight with alcohols of high melting point, and its complete saponification was difficult. It was eventually effected by dissolving 10 Gm. of the wax in 50 Cc. of benzene, and heating the solution for eight hours on the hot-water bath with an excess of alcoholic potassium hydroxide solution. The crude montanic acid separated from the saponified liquid was a solid brown substance with a neutralization value of 143. By treatment with hot petroleum spirit it could be decomposed into dark insoluble hydroxy acids melting above 100° C., and a light, soluble, wax-like substance melting below 100° C. These acids did not give Liebermann's cholesterol reaction. The wax contained only traces of volatile acids. The unsaponifiable matter was a dark brown wax-like body, which gave the cholesterol

reaction on treatment with acetic anhydride and sulphuric acid. When recrystallized from alcohol and decolorized with animal charcoal this substance yielded a yellow wax-like body, which no longer gave the cholesterol reaction, whereas the residue left on evaporation of the alcoholic solution gave a pronounced coloration test. The wax had a strong optical rotation, and preliminary experiments, to determine to which constituents this was due, showed that the unsaponifiable matter and the acids soluble in petroleum spirit were dextrorotatory. Montan wax is regarded by Krämer and Spilker as the parent substance of petroleum, and the author's experiments may thus throw light upon the origin of the optically active constituents of petroleum.—Pharm. Journ., March 20, 1909, 394; from Chem. Rev. Fett u. Harz-Ind., *15* (1908), 193–195.

Eggs—Food Value.—S. Aufrecht and F. Simon observe, that recent experiments show that the food value of eggs is not appreciated as highly as it deserves; eggs deserve to be much used, both in disease and in health, on account of the ease with which they are digested, their high food value, and the extent to which they are absorbed. Personal experiment has shown that when under a mixed or meat diet, the absorption of nitrogen was least; it was increased with a regimen of lightly cooked eggs; and slightly further increased when the food was limited to raw eggs. Uncooked eggs show only a very slightly greater food-value that those lightly cooked. The amount of fat which passed through the body unabsorbed under a diet of meat, cooked eggs, and raw eggs, was 14.39, 6.25, and 4.09 per cent. of the quantity administered in each case. The unabsorbed nitrogen amounted to 5.22, 3.81, and 3.1 per cent. respectively. Eggs have a markedly higher food value in a mixed diet than a corresponding quantity of meat.—Pharm. Journ., June 12, 1909, 795; from D. Med. Wschr., through Brit. Med. Journ. Epit., 1909, 80.

Silkworm Gut—Collection and Preparation.—Max von dem Borne gives in his "Taschenbuch der Angelfischerei" an interesting account of the collection and preparation of the so-called silk-worm gut, also known as poil, crin, or fil de Florence, and cava de seta. It is composed of the same substance from which the silk-worm spins its silk; but whereas the caterpillar is capable of spinning a thread several thousand meters long, the same material will only yield a gut of from 0.3 to 0.9 meters in length. The gut is prepared principally in Italy, Spain, Portugal and Syria as follows: When the caterpillar has completely matured and grown to full size. when it ceases to eat and shows a tendency to spin, it is killed and immersed in strong wine vinegar. After 6–8 hours its body is opened, as the two gut glands of unequal length are found in it, which are removed and stretched out by pulling at each end. The gut is then drawn through water and laid out to dry. To remove its yellow cuticle and to bleach the gut, it is washed with a solution of soda and potash, soaked in water,

rinsed with clean water, and stretched by placing one end between the teeth and pulling at the other. It is desirable that the gut so obtained should be perfectly round, but this not uniformly attainable. To accomplish this and to reduce its diameter, it is frequently drawn out in the same manner as wire is drawn from metal; but this weakens the gut, which is uniformly stronger if drawn out in the natural way described.—Pharm. Ztg., lii, (1908), No. 94, 929.

INORGANIC CHEMISTRY.

General Subjects.

Chemicals of the Pharmacopœia—Critical Observations.—Wm. Mittelbach enumerates and makes some practical comments on a number of chemicals official in the U. S. P., including: salts of magnesium, manganese, lead, strontium and zinc. Regarding "phosphorus," he says that a more handy commercial form than the present cylindrical pieces is desirable. "Talcum" should be official only in the purified form.

Otis W. Smith enumerates and makes critical remarks on some of the potassium and sodium salts recognized in the U. S. P., VIII., and similarly, H. M. Pettit discusses the mercurials, cerium oxalate, copper sulphate, lithium salts, iodine, chromic acid, and kaolin.—Proc. Mo. Pharm. Assoc., 1908, 107–109, and 116–119.

The Acids of the U. S. P.—Review.—Francis Hemm presented an interesting paper on the acids of the U. S. P., in which, after a preliminary review of the additions made in the 8th revision, he makes some practical suggestions concerning all the acids and their salts now official, that may aid in the coming revision of the Pharmacopœia.—Proc. Mo. Pharm. Assoc., 1908, 109–116.

Metallic Oxides—Classification by their Action on Primary Alcohols.—Paul Sabatier and A. Mailhe have allowed the vapors of primary alcohols to act upon a number of different metallic oxides at temperatures between 350° and 400° C. They find that the oxides can be divided into four classes, according to their behavior under these conditions: 1. Those which below 400° C. undergo no reduction and have no appreciable effect upon alcohols; these include calcium, barium, and strontium oxides, calcined magnesia, calcined silica, and titanic oxide, TiO_2. 2. Those which are rapidly reduced to metal or lower oxide. 3. Those which are not reduced at temperatures below 400° C., but act catalytically, yielding either aldehyde or ethylene hydrocarbon, or both. 4. Those which react only slowly and cause the condensation of the alcohol. Furthermore, the

authors find that certain reducible oxides, for example, Sb_2O_5, Sb_2O_3, Bi_2O_3, react with primary alcohols below 400° C., giving water and aldehyde; neither gas nor acid is formed, and a semi-metallic mass is left. When the oxide is reduced more readily the aldehyde is partially oxidized, giving either the corresponding acid or water and carbon dioxide. Very often the metal or lower oxide, which is formed catalytically, decomposes the primary alcohol. Some of the oxides which are reduced by alcohol have a catalytic action on the latter, which lasts as long as any of the original oxide is left. Again, some metallic oxides which are not reducible act as catalytic decomposition agents upon primary alcohols at temperatures below 360° C. Certain oxides, *e. g.*, manganous oxide, stannous oxide, decompose the alcohols, setting hydrogen free. Other oxides, *e. g.*, alumina and thoria, dehydrate alcohols; thus with ethyl alcohol they give ethylene, and some aldehyde condensation occurs; others give rise to both reactions simultaneously. The proportion of the two reactions varies according to the nature of the oxide and the temperature. The effect of raising the temperature is to increase the velocity of the two reactions, especially that of the aldehyde condensation.—Chem. News, July 31, Aug. 14 and Aug. 21, 1908, 59, 83 and 96; from Compt. rend., *146* and *147*, Nos. 26, 1 and 2.

OXYGEN.

Oxygen—Modern Agents Introduced for its Convenient Production.—James S. Gleghorn contributes an interesting paper in which he calls attention to and gives a description of a number of products which have modernly been introduced for the purpose of producing or replacing oxygen. These include the *peroxides* of *zinc*, *calcium* and *magnesium*, and *sodium perborate*, which come nearest to the properties of "Ozone," inasmuch as in liberating their available oxygen they leave either a colorless solid residue, which can be easily gotten rid of by filtration, or a soluble salt of a neutral nature. They will not only prove valuable to the pharmacist, physician and dentist, but to the cosmetic trade as well, and should be given careful consideration.—Proc. Penna. Pharm. Assoc., 1908. 289–291.

Oxygen—Preparation from Sodium Peroxide.—L. Wolter recommends the following convenient method for generating oxygen from sodium peroxide: In an iron capsule of about 2 liters capacity 100 Gm. of potassium nitrate is melted: to this is added slowly and with constant stirring with an iron spatula a mixture of 100 Gm. of sodium peroxide and 25 Gm. of magnesium oxide. A thick liquid is thus obtained which must be carefully and persistently stirred. The mass is then scraped out on to an iron plate, or the capsule very carefully cooled by dipping into cold water. The very hard cake thus obtained is broken into large pieces and preserved in an air-tight metal container. To preserve the substance per-

manently against decomposition by moisture, etc., the pieces may be coated with melted paraffin. For use the pieces are again broken and placed in a Kipp's or other suitable gas-generating apparatus, with diluted hydrochloric acid as the generating medium. The gas is run through solution of potassium hydroxide in order to free it from any traces of carbon dioxide.—Pharm. Journ., Jan. 9, 1909, 32; from Chem. Ztg., 1908, No. 88, 1066.

HYDROGEN.

Pure Hydrogen—Preparation.—Maurícheau-Beaupré describes a new process for preparing pure hydrogen, which is based on the decomposition of water, at ordinary temperature, by aluminum specially prepared. The aluminum, in fine filings, is treated with small quantities of mercuric chloride and potassium cyanide, each in powder. The mass then becomes slightly heated. The preparation is in the form of a coarse metallic powder having a density of about 1.420. It keeps indefinitely if protected from moisture. Its most remarkable property is its action on water. A kilogram of the preparation, treated with excess of water, liberates about 1,300 liters of hydrogen at a temperature of 15° C. and a pressure of 760 Mm. On account of this property the author has given it the name "hydrogenite." To prepare hydrogen by means of it, 1 kilogram is treated with about 1 liter of water. In a few seconds the reaction commences, and heat is gradually developed. The heat thus produced is regulated, so as not to exceed 80° C., by running water into the generating vessel. On maintaining the temperature at about 70° C., the quantity of aluminum contained in the apparatus is completely oxidized in about two hours. The conditions stated are those necessary in order to obtain the total yield of hydrogen.—Pharm. Journ., Oct. 3, 1908, 434; from Compt. rend., Aug. 3, 1908, 310.

Drinking Water—Progress in Municipal Purification.—William George Toplis at the April pharmaceutical meeting of the Philadelphia College of Pharmacy gave an interesting account of progress made in the purification of the drinking water in Philadelphia, which, after years of doubt and scandalous derision by irresponsible sensationalists, has triumphantly succeeded in delivering to the inhabitants of that city an amount of clarified, purified and wholesome water, derived from the polluted waters of the Delaware and Schuylkill rivers, equal to 200 gallons daily or over 70,000 gallons annually, per capita of population. Originally charged with the pollution introduced during the traverse of these streams and their tributaries through the most populous territory of the state, it is a remarkable fact that by the system of sedimentation and filtration (through sand filter described) there is an average reduction in turbidity of 99.46 per cent., a minimum not less than 88.9 per cent., and that the maximum of 100 per cent. is also reached; while the showing of bacteria elimination is quite as

satisfactory—the average reduction of bacteria being 99.50 per cent., the minimum 97.61 per cent., and the maximum 99.96 per cent. Moreover, with the improvements of appliances and methods resulting from further experience, there is little doubt that the supply of pure and wholesome drinking water will be practically unlimited, depending only on the amount of money invested, and that this must be comparatively trifling is evident since under present conditions the cost of water delivered annually amounts only to 30 cents per capita.—Amer. Journ. Pharm., May, 1909, 220–223.

Drinking Water—Rapid Method of Extemporaneous Purification.—According to J. Laurent the following method, suitable for quickly purifying large or small quantities of water, rendering them safe for drinking purposes, is especially suitable for troops in the field or for travelers. It is a modification of the familiar permanganate method. To each liter of water to be purified powdered potassium permanganate 0.03 Gm., and powdered alum 0.06 Gm., are added. After standing five minutes the pink color should still be evident; if it be not so a second or third similar quantity of the salts are added. Excess of permanganate is then removed by means of powdered sodium thiosulphate, 0.03 Gm.; dried washing soda, 0.06 Gm. After ten minutes, by simply straining through absorbent cotton a perfectly pure drinking water is obtained. The permanganate and alum and the thiosulphate and carbonate may conveniently be prepared in tablet form. In this state, with ordinary precautions, they will keep indefinitely. Or stronger solutions of the two reagents may be employed for quickly dealing with large volumes of water.—Pharm. Journ., Dec. 5, 1908, 726; from Journ. de Pharm. et Chim., *28* (1908), 392.

Drinking Water—Sterilization by Calcium Hypochlorite.—J. C. Thresh has made experiments with calcium hypochlorite, using natural waters, to which the *Bacillus typhosus* and *Bacillus coli* were added, without at the same time introducing an abnormal quantity of organic matter. He finds that exceedingly minute quantities of this chemical suffice for sterilization—in most cases 1 part of Cl as hypochlorite to 1,000,000 of water being sufficient, and that the action takes place in a very few minutes. By the addition of a little sodium bisulphite at the end of the time required for effecting the destruction of the bacteria, the remaining chlorine can be removed, and the palatability of the water remains unimpaired.—Pharm. Journ., Dec. 19, 1908, 804; from Lancet, Nov. 28, 1908, 1597.

Drinking Waters—New Test for Nitrites.—A. Rochaix recommends symmetric dimethyldiaminotoluolphenazine hydrochloride, known as "neutral red" or "toluol red," as a very sensitive reagent for nitrites in drinking waters, producing with these a blue color. For this purpose a solution of 0.2 Gm. of the "toluol red" in 1000 Cc. of water is used, 20 Cc. of the reagent being added to 10 Cc. of the water and 1 to 3 Cc. of

20 per cent. sulphuric acid, when, upon shaking, the color changes from violet to bright blue. If the water is alkaline, a yellow color may first be produced, but this does not affect the ultimate tint. The reaction will detect 0.05 Mgm. of nitrous acid in the liter. Care must be taken to employ the sulphuric acid diluted as indicated, for the strong acid will give a blue color in the absence of nitrites.—Pharm. Journ., April 10, 1909, 494; from L'Union Pharm., *50* (1909), 62.

Hydrogen Peroxide—U. S. P. Method of Determining Acidity and Process of Assay.—Prof. Virgil Coblentz and Dr. Otto B. May, in view of the difficulties experienced by Benj. L. Murray and others in determining the acidity of hydrogen peroxide solutions by the present U. S. P. method with phenolphthalein as indicator, have made a series of experiments which demonstrate that our present method yields results in excess of the actual facts. They find, however, that concordant results are obtained both with litmus and with methyl orange as indicators, preference being given to methyl orange because of its more satisfactory deportment in the presence of carbonates. Regarding the official process of assay, the experiments of the authors indicate that there is no necessity for any change in the present method.—Merck's Rep., Aug., 1908, 202.

Hydrogen Dioxide—Determination of Acidity.—Endemann finds that the direct determination of the acidity in solutions of hydrogen dioxide at the ordinary temperature gives only one-half of the true acid content, and that to obtain exact results it is necessary to heat the liquid with sodium hydroxide. He therefore recommends the following method: 50 Cc. of solution of hydrogen dioxide and 10–15 Cc. of $\frac{N}{5}$ solution of sodium hydroxide are gently heated in a platinum dish until the oxygen is completely eliminated. After cooling, phenolphthalein is added and the excess of NaOH is titrated with $\frac{N}{5}$ HCl. If the decomposition is effected in a glass vessel, platinum wire must be introduced to facilitate the decomposition by catalylic action, otherwise the reaction is slow and the glass is attacked strongly.—Pharm. Ztg., liv (1909), No. 35, 345; from Ztschr. f. angew. Chem., 1909, No. 15.

HALOGENS.

Halogens—Simplified Gravimetric Estimation.—Alefeld recommends the following simplified method for the gravimetric determination of halogens, which assures their rapid and complete precipitation as silver salts: The halogen solution is poured into a beaker containing about 5 Cc. of ether, about 5 Cc. of diluted nitric acid are added, and silver nitrate solution is then dropped into the mixture, which is agitated by carefully rotating the beaker. The precipitate of silver-halogen thus produced quickly conglobates and may at once be collected on a filter, washed, dried, and weighed.—Pharm. Ztg., liv (1909), No. 11, 105; from Zschr. f. analyt. Chem., xlviii (1909), 79.

Hydrochloric Acid.—Detection by Günsburg's Reaction in the *Gastric Juice,* which see under "Organic Chemistry."

Günsburg's Reagent—Substitution of Resorcinol for Phloroglucin.—Barberio recommends that the phloroglucin in Günsburg's reagent for hydrochloric acid in the gastric juice (phloroglucin, 2 Gm., and vanillin, 1 Gm., in alcohol, 30 Gm.), be replaced by resorcinol in 7 per cent. solution, which, while equally sensitive, gives a more permanent and sharply defined reaction. Furthermore, the author finds that the vanillin may be substituted by protocatechuic aldehyde, and recommends that the two ingredients composing the reagent be preserved in separate solutions, to be mixed as required.—Pharm. Ztg., liv (1909), No. 4, 38; from Il Policlinico, xv, No. 8.

Calcium Hypochlorite—Manufacture as a Substitute for Chlorinated Lime.—As is well known, commercial chlorinated lime contains under the most favorable conditions about 40 per cent. of available chlorine (= calcium hypochlorite). According to "Drogenhändler" a method has now been developed and introduced in practice which secures a chlorinated lime which, containing from 80 to 90 per cent. of available chlorine, may be regarded as practically pure calcium hypochlorite. According to the patented process, milk of lime is saturated under continuous stirring with chlorine. The resultant solution of calcium hypochlorite is filtered and evaporated under observance of certain precautions, which prevent as far as possible the decomposition of the salt, these consisting in concentrating the solution at a low temperature in a vacuum, or very rapidly under normal pressure. When a certain concentration is reached, calcium hypochlorite is deposited in a crystalline state, and may then be separated from the mother liquor in the usual way. The product, aside from its high chlorine content, has the advantage of dissolving clear in water, requiring no filtration, and that owing to the absence of calcium chloride it is non-hygroscopic, thus avoiding the precautions in packing and preservation necessary in the case of ordinary chlorinated lime.—Pharm. Ztg., liii (1908), No. 94, 929.

Chlorinated Lime—Spontaneous Combustion.—Referring to a number of recent cases of the spontaneous combustion of chlorinated lime, Possaner traces these phenomena to the high temperature produced by the splitting up of the chlorinated lime into calcium chloride and oxygen, whereby organic substances present (the wooden containers) are ignited. —Pharm. Ztg., liii (1908), No. 89, 880; from Wchbl. f. Papierfabr., 1908, 2611.

Chlorates—Detection with Aniline Hydrochloride.—Virgill proposes a solution of aniline hydrochloride in fairly strong hydrochloric acid for the analytical determination of chlorates, which, both in substance and in solution, produce with this reagent a violet color, soon changing to blue,

finally disappearing with formation of a green-blue precipitate. The author was able to recognize 0.02 Mgm., and even as little as 0.007 Mgm. of $KClO_3$ by means of this reaction, which can moreover be made quantitative by the colorimetric method. The detection of chlorates by means of sulphuric acid, usually employed, has the disadvantage that this acid also decomposes other bodies, for example nitrites, which render the reaction doubtful.—Pharm. Ztg., liv (1909), No. 45, 442 ; from Ann. Chim. analyt. appl., *14*, 85.

Potassium Chlorate—Contamination with Bromate.—Examinations of five samples of potassium chlorate, which was required by Ernst Pieszezek to be perfectly pure for certain special purposes, proved the presence of small percentages of potassium bromate in all of the samples. In a case cited, the sample contained 0.26 per cent. $KBrO_3$. The author attributes this contamination to the modern electrolytic method of preparing potassium chlorate from potassium chloride derived from "karnallite," which is always contaminated with bromide.—Pharm. Ztg., liv (1909), No. 33, 325.

Potassium Chlorate—Inexplicable Explosion with Fatal Results.—In view of the importance to the makers of tablets, Sharp and Dohme publish the actual facts regarding a recent explosion of potassium chlorate during its compression into tablets by an experienced attendant. The salt was of the kind usually known as "santonin crystals." It was examined for purity before compressing, and the quantity remaining was again tested and found to be faultless and quite clean. It was being compressed upon an ordinary rotary machine of a type which we have employed for several years with perfectly satisfactory results, and similar to those which have been used elsewhere for a long time. The machine after a thorough cleaning had been working on this particular lot of chlorate for one whole day and for an hour and a half the next when a violent explosion occurred. The machine was wrecked, and a portion of it unfortunately struck the attendant on the head with fatal result. So far the firm have not been able by careful investigation to determine any reason for the explosion, nor to find that conditions were in any way different from those under which many hundreds of tons have been successfully handled.—Bull. Pharm., Nov., 1908, 474.

Pure Hydriodic Acid—Preparation.—Dr. Gunnar Heikel recommends the following process for preparing an almost chemically pure hydriodic acid, which is simple, and regarded as being superior to those ordinarily described : A solution of iron iodide is prepared in the usual way from iodine and iron filings. To this solution somewhat more than the equivalent quantity of pure precipitated barium carbonate is added, and the mixture is boiled for 3–6 hours, or until the addition of ammonia to a portion of the filtrate produces only a slight precipitation, which does not dimin-

ish after prolonged boiling—the reaction taking place according to the equation: $FeI_2+BaCO_3=FeCO_3+BaI_2$. A slight amount of barium carbonate remaining in the filtrate after the removal of the iron carbonate, is usually sufficient to precipitate any iron retained in solution. Hence, the filtrate, after cooling and standing a few hours becomes turbid, and after renewed filtration will be found perfectly free from every trace of iron. Should this not be the case a further boiling with a little barium carbonate will throw out all the iron, and a solution of pure barium iodide will result. This solution is now diluted to a definite volume, and its strength accurately determined, which can be done by precipitating the barium with sulphuric acid and weighing the sulphate. Or the iodine, as the author prefers, may be determined by Volhard's method. In either case, the figures obtained determine the exact quantity of sulphuric acid required for the decomposition of the barium iodide and the production of a pure solution of hydriodic acid of the desired percentage. But, as barium as an impurity is more objectionable than sulphuric acid, just sufficient excess of the acid should be used to produce a very slight cloud on addition of barium chloride.—Amer. Journ. Pharm., Dec., 1908, 581–582.

Alkali Iodides—Acidimetric Determination.—Rupp and Pfenning suggest an acidimetric method for the determination of alkali iodides, which is based upon the interaction of alkali iodides with mercuric cyanide and the indirect titration of the alkali mercury iod-cyanide formed. To a solution of 1 to 2 Gm. mercuric cyanide in 30 to 50 Cc. water, in a 100 Cc. flask, a neutral solution of 0.5 to 1.5 Gm. of the alkali iodide is added, followed by a little potassium chloride and 25 Cc. $\frac{N}{2}$ hydrochloric or sulphuric acid. The volume is then adjusted to 100 Cc., and the excess of acid is titrated in 50 Cc. of the filtrate, using methyl orange as indicator. According to quantity of iodide, either normal or $\frac{N}{4}$ acid may also be used for the titration, the factors being the following: 1 Cc. N acid = 0.1270 Gm. iodion, or $\frac{N}{2}$ acid = 0.0635 Gm. iodion, or $\frac{N}{4}$ acid = 0.03175 Gm. iodion.—Arch. d. Pharm., *247*, No. 2 (April 3, 1909), 108–110.

Sodium Iodide—Definite Crystalline Compound with Glucose.—A. Wuelfing has secured a German patent for the preparation of a definite compound of glucose and sodium iodide, according to which 36 parts of dry glucose and 15 parts of sodium iodide are heated together with methyl alcohol, acetone, or any indifferent organic solvent, to their boiling point. The necessary quantity of water is then added, the solution is filtered and the compound crystallized-—Pharm. Ztg., liv (1909), No. 2, 17.

Iodic Acid—Action of Heat on the Anhydride.—Marcel Guichard finds that when iodic anhydride is heated it undergoes no change till a temperature of 300° is reached. It then begins to evolve oxygen and iodine, the undecomposed part changing color to brown, and apparently increasing

in volume. When partially decomposed the anhydride retains some oxygen and free iodine very persistently, the only substances which can remove the brown coloration, which is due to small quantities of iodine, being those which dissolve the anhydride and combine with the iodine; for instance, potassium iodide.—Chem. News, Jan. 15, 1909, 35; from Compt. rend., *147* (1909), No. 24.

New Fluorides—Preparation and Characters.—Otto Luff has obtained and describes a number of new fluorides, which he has obtained from niobium, tantalum and uranium.

Niobium Pentafluoride, $Nb.F_5$, may be prepared by acting on niobium, obtained from the pentoxide, with elementary fluorine at 250° C. It forms colorless, strongly refracting crystals which melt at 72° to 73° C., and boil in glass vessels under 760 Mm. pressure at 236° C. The residue remaining in the flask is light blue. Niobium pentafluoride is very hygroscopic, quickly deliquesces in air, and gives a clear solution with water, without separation of niobic acid. With caustic soda, fluoxyniobate is precipitated. Caustic soda and ammonia precipitate niobic acid from a solution of the fluoride in water.

Tantalum Pentafluoride, TaF_5, can be prepared by a similar method. It also forms colorless strongly refracting crystals which are hygroscopic and deliquesce in air. They melt at 94° C. and boil at 225° to 226.5° C. Dry glass is attacked by tantalum pentafluoride only very slowly at the ordinary temperature, but at higher temperatures tantalic acid is formed. When uranium is subjected to the action of fluorine a violent reaction occurs, and a black mass is first formed, and then light green products, consisting chiefly of uranium tetrafluoride and containing some oxyfluoride, are obtained, while only small quantities of the hexafluoride can be prepared by this method. The reaction occurs far more quietly if uranium pentachloride is used instead of the metal itself. When heated with fluorine this readily yields the hexafluoride at a low temperature.

Uranium Hexafluoride, UF_6, forms colorless monoclinic crystals, fuming in air. It sublimes on heating without melting. It is very hygroscopic, gives a clear yellowish green solution with water, and reacts with glass in presence of traces of water. The latter acts as a catalytic agent, and the products of the reaction are silicon tetrafluoride and uranium oxyfluoride.—Chem. News, Mar. 12, 1909, 132; from Ber. d. D. Chem. Ges., *42*, (1909), No. 2.

Calcium Fluoride—Therapeutic Use.—A. Brissemoret observes that it is now generally recognized that a certain amount of fluorine in the form of calcium fluoride is a necessity for the proper strengthening and consistence of the bones or the normal hardness and condition of the teeth. Any deficiency of the supply is indicated by abnormal conditions of these parts of the body. Such states are rapidly ameliorated by the administration of

calcium fluoride as, for instance, in the form of the powder originally prescribed by A. Robin: Magnesium carbonate, 10 Cgm.; calcium carbonate, 25 Cgm.; calcium triphosphate, 25 Cgm.; calcium fluoride, 1 Cgm.; white sugar, 1 Gm. One such powder to be taken daily. The author finds that the administration of calcium fluoride to the extent of 5 milligrams per diem, 15 days a month, has a marked influence in arresting dental caries.—Pharm. Journ., Sept. 19, 1908, 334; from L'Union Pharm., *49* (1908), 352.

Chromium Fluorides—Kinds and Composition.—According to A. Werner and N. Costachescu, two fluorides of the hexaquochromium series exist, the normal $[Cr(OH_2)6]F_3$, and the esotrihydrate $[Cr(OH_2)6]-[OH_2F]_3$. They are both violet in color. Two hexafluorochromates of the hexaquo series are known, namely, the normal $[Cr(OH_2)6](CrF_6)$ and the monoesohydrate $[Cr(OH_2)6](CrF_6)+H_2O$. An isomer of the latter is trifluorochromium, which can be represented by the formula $2(Cr(OH_2)_3F_3)+1HO_2$.—Chem. News, Jan. 29, 1909, 59; from Ber. d. D. Chem. Ges., *41* (1908), No. 17.

HELIUM.

Helium—Liquefaction.—In a telegram to Sir James Dewar, July 14, 1908, Professor Kammerlingh Unnes announced the successful liquefaction of helium (see Proceedings, 1908, 4), obtaining 60 cubic centimeters of liquid. This had a boiling-point of 4.3° C. absolute, and did not solidify when exhausted to a pressure of 10 millimeters of mercury, at which pressure the temperature must have been reduced to within 3° of the absolute zero, *i. e.*, about one-fourth of the temperature of hydrogen in corresponding conditions, as that again is about one-fourth of the corresponding nitrogen temperature.—Chem. News, July 24, 1908, 37.

SULPHUR.

Colloidal Sulphur—Preparation and Properties.—Sobrero and Sehni have previously observed that when hydrogen sulphide is passed into sulphurous acid, sulphur is liberated and forms a turbid pseudo-solution. Soluble colloidal sulphur has now been obtained by Raffo by adding strong solution of sodium thiosulphate, drop by drop, into cooled sulphuric acid, specific gravity, 1.840. The thiosulphuric acid thus liberated is decomposed according to the equation—

$$H_2S_2O_3=H_2O+S \text{ insoluble}; \quad 2H_2S_2O_3=2H_2S+SO_2;$$

and then—

$$2H_2S+SO_2=2H_2O+3S \text{ (soluble)}.$$

The stability of this solution of colloidal sulphur is dependent on the presence of sodium sulphate.—Apoth. Ztg., xxiii (1908), No. 67, 599; from Chem. Ztg. Rep., 1908, 418.

Thiozonides—A New Class of Sulphur Compounds.—H. Erdmann has found sulphur to exist in the form of a molecule containing three atoms of sulphur, analogous to ozone, which he calls "thiozone." Like ozone, thiozone is capable of forming thiozonides analogous to ozonides. For example, the author prepares the

Thiozonide of Linalyl Acetate. Thus, 25 Gm. of pure linalyl acetate (specific gravity 0.901 at 19° C.) is heated on an oil-bath at a temperature of 160° C. for eight hours, with 12 Gm. of flowers of sulphur, under a reflux condenser. There is then formed a dark-brown liquid, which gradually becomes viscid, and the reaction is complete when, on cooling, no sulphur crystallizes out. The thiozonide thus formed has the formula $C_{12}H_{20}O_2S_3$; it occurs as a black-brown thickish syrup of peculiar odor, insoluble in most of the usual solvents, but soluble in acetic ether and nitrobenzene. It quickly absorbs oxygen, and must, therefore, be kept in well-closed vessels. Its specific gravity, when freshly prepared, is 1.133 at 23° C. It acts as an acid with alkali sulphides, thus, with sodium sulphide it yields sodium thiozonidate, $C_{12}H_{20}O_2S_4Na_2$, which is soluble in alcohol. On pouring such solution into water the thiozonidate is decomposed into sodium sulphide, which remains in solution, and thiozonide, which separates as a fine emulsion. This emulsion has been recommended in the treatment of itch.—Pharm. Journ., May 29, 1909, 738; from Anal. d. Chem., *362* (1908), 133.

Hydrogen Sulphide—Lowest Oxides.—Emil Fromm observes that the lowest oxides of hydrogen sulphide are sulphur hydrate, H_2SO, and sulphoxylic acid, H_2SO_2. Sulphur hydrate is not known either free or in inorganic compounds. Derivatives of it are the sulphoxides, R.SO.R, and the hypothetical compounds, R.SOH, the existence of which has, however, never been demonstrated with certainty. All organic disulphides with adjacent double bonds of general formula $\frac{X:C.S.S.C:Y}{R \quad R_1}$ are decomposed by water, alkalies, and amines, giving elementary sulphur. The author's experiments have proved that sodium tetrathionate also yields elementary sulphur, and thus decomposes in exactly the same way as organic disulphides with adjacent double bonds, thus: $Na_2S_4O_6+H_2O=S+NaHSO+NaHS_2O_3$. Sodium ethyl thiosulphate and the aromatic disulphide give no elementary sulphur on hydrolysis, but in all probability the hypothetical oxidation product R.SOH is formed. This substance is a strong oxidizing agent, and is unstable in alkaline solution, readily giving mercaptan and sulphinic acid, $2R.SOH=R.SH+R.SOOH$. Sulphoxylic acid has not yet been obtained in the free state; complicated salts of it are the hydrosulphites. A simple salt of sulphoxylic acid, zinc sulphoxylate, $ZnSO_2$, has been prepared by the action of zinc dust on an ethereal solution of SO_2Cl_2, but the compound has not yet been isolated.—Chem. News, Dec. 4, 1908, 281; from Ber. d. D. Chem. Ges., *41* (1908), No. 19.

Hydrogen Persulphide—Preparation and Properties.—Rudolf Schenck and V. Falke prepare hydrogen persulphide as follows: Potassium polysulphide solution is poured into concentrated hydrochloric acid, and the clear light yellow oil thus formed is separated from the aqueous liquid, and washed with dilute hydrochloric acid. The oil can be dried with calcium chloride and distilled off from the drying agent in a vacuum, the vessels in which the raw sulphide is distilled having previously been carefully freed from traces of alkali. Thus a strongly refracting oil is obtained with a characteristic odor, recalling that of camphor. The substance is very volatile and also very labile, readily splitting up in presence of small quantities of alkali into sulphur and hydrogen sulphide. Hydrogen persulphide is dissolved by carbon disulphide, benzene, alcohol, and ether, but is readily decomposed by solvents into sulphur and hydrogen sulphide. The composition of the persulphide may be determined by decomposing it completely into sulphur and hydrogen sulphide by means of ether, and estimating the amount of each constituent. The results obtained agree very well with the formula H_2S_3, and this formula is confirmed by molecular weight determination in which the depression of the freezing point is measured, bromoform being used as solvent.—Chem. News, Oct. 16, 1908, 198; from Ber. d. D. Chem. Ges., *41* (1908), No. 12.

Hydrogen Persulphides—Preparation and Composition.—Ignaz Bloch and Fritz Höhn have prepared hydrogen persulphides corresponding to the formulas H_2S_2, H_2S_3, H_2S_5, H_2S_6, H_2S_7, and H_2S_8, though in no case in a pure state. The best characterized of these are the derivatives of the compounds H_2S_5 and H_2S_8, which have been obtained and analyzed by different investigators. By the action of dilute hydrochloric acid upon sodium polysulphide at a temperature from −10° to 0° C., an oil consisting of crude hydrogen persulphide can be obtained. From the analysis of the purified product it is clear that Reb's statement that whatever polysulphide is used the compound formed is always H_2S_5, is incorrect. The authors find that unless special precautions are taken no single chemical compound is obtained. By subjecting the crude hydrogen persulphide to fractional distillation in an apparatus through which a current of dry hydrochloric acid has been led (to neutralize the alkalinity of the glass), a distillate is obtained, consisting of

Hydrotrisulphide, H_2S_3. This is a colorless liquid with a pungent smell, recalling carbon disulphide and camphor, and when warmed yields H_2S. It is inflammable, and is decomposed by alkalies. Concentrated sulphuric acid reacts slowly with it, giving sulphuric dioxide. It behaves as a reducing and sulphating agent, and is also capable of acting as an oxidizer. When the receiver in which the hydrotrisulphide is cooled in the process of preparation described, it is found that the percentage of H_2S in the product is high. This is due to the presence of some

Hydrodisulphide, H_2S_2, and this may be obtained in a pure condition by heating the receiver and collecting the product in another cooled vessel. So obtained, hydrodisulphide is a clear, yellowish liquid, which is inflamable, and is decomposed by distilled water and by alkalies. Concentrated sulphuric acid also decomposes it, yielding amorphous sulphur and sulphur dioxide.—Chem. News, July 10, 1908, 24; from Ber. d. D. Ch. Ges., *41* (1908), No. 9.

Hydrogen Trisulphide — Convenient Preparation.—According to R. Schenck and V. Falke, hydrogen trisulphide (H_2S_3) may be conveniently prepared by pouring a solution of potassium polysulphide into pure concentrated hydrochloric acid, when the trisulphide separates as a bright yellow oil. It is separated, dried over calcium chloride and distilled *in vacuo*. It occurs as an almost colorless, strongly refracting mobile liquid, having an odor reminding of camphor. In contact with alkali it is decomposed into hydrogen sulphide and sulphur. It is soluble in carbon bisulphide, benzene, alcohol, and ether, but soon decomposes with formation of hydrogen sulphide and sulphur.—Pharm. Journ., Aug. 29, 1908, 258; from Ber. d. D. Chem. Ges., *41* (1908), 2600.

Sulphur Monochloride — Action on Metalloids and Metals.—Paul Nicolardot finds that sulphur, selenium, and yellow phosphorus readily dissolve in sulphur monochloride in the cold. Arsenic is not attacked, but antimony reacts in the cold, while there is no action with carbon, silicon, and boron. Among all the metals only tin, aluminum, mercury, and iron are affected by treating either with hot or cold sulphur monochloride. With iron it is found that the monochloride acts like hydrochloric acid and not like chlorine. Possibly it has no action on the metals of the alkalies and alkaline earths because a very thin layer of chloride is formed and stops the reaction.—Chem. News, Jan. 15, 1909, 35; from Compt. rend., *147* (1908), No. 24.

Sulphur Chloride — Action on Metallic Oxides.—According to F. Bourion, sulphur chloride readily converts into chlorides even those metallic oxides with which a mixture of chlorine and sulphur dichloride gives poor results. The equation is $2MO + 2S_2Cl_2 = SO_2 + 2MCl_2 + 3S$, which shows that there is an excess of sulphur equal to three-quarters of that contained in the reacting sulphur chloride. Thus the lowest temperature at which the reaction occurs is determined by observing when a deposit of sulphur appears, and the reaction is commenced at this temperature; the temperature is afterwards gradually raised to a red heat. With MnO_2, MnO, NiO, CoO, and the oxides of the rare earths the action begins before the boiling point of sulphur is reached, and with chromium sesquioxide at a temperature above the boiling point.—Chem. News, Febr. 26, 1909, 108; from Compt. rend., *148* (1909), No. 3.

TELLURIUM.

Tellurium—Homogeneity.—The statement of Mendeleeff as to the possibility of tellurium containing another element, and his views as to its incorrect weight, have led to an extended series of critical studies on this subject by different authors. Victor Lehner now reports the character and results of his researches on the same subject, by which he demonstrates that tellurium in his hands has shown no signs of breaking apart in any of the reactions which had for their object a study of the elementary character of the metal, nor that in the various reactions or derivatives which have been studied has the element shown any indication of other than simple character. He concludes that tellurium still remains an exception in the periodic arrangement of Mendeleeff, its atomic weight being higher than that of iodine, and that either tellurium is abnormal in a direction which has not yet received careful study, or that we do not yet appreciate all the principles of the periodicity of the elements.—Chem. News, July 17, 1908, 27–29; from Journ. Amer. Chem. Soc., xxx, No. 5.

Tellurium—Determination of Cryoscopic Constant by Means of the Tellurides of Arsenic and Bismuth.—H. Pélabon finds that fused tellurium dissolves easily in arsenic. The liquid obtained is grey when little arsenic is present, and darkens gradually to black as the proportion of arsenic increases. The temperature of solidification of the liquid decreases rapidly and regularly from 452° C., the melting point of tellurium, to 329° C., the temperature of solidification of the mixture formed 3 atoms of tellurium to 1 of arsenic. If the proportion of arsenic is increased the temperature of solidification rises, reaches a maximum value 362° C. for the compound As_2Te_3, then falls, becomes 355° C., for the mixture $9As + 11Te$, and again rises to 358° C. for all mixtures containing more than 1 atom of arsenic to 1 of tellurium. The fusion curve of mixtures of tellurium and bismuth from the melting point of tellurium 452° C., has first an almost rectilinear part, which ends at 410° C., corresponding to the eutectic mixture containing about 15 per cent. of bismuth. From this point for mixtures richer in bismuth, the temperature of solidification increases, and reaches a maximum at 583° C. for the compound Bi_2Te_3. It then falls regularly at 263° C., which is the solidification point of the eutectic containing 1 per cent. of tellurium. The temperature of solidification then increases to 270° C., which is the melting point of bismuth. Thus, if a small quantity of arsenic or bismuth is added to tellurium, compounds As_2Te_3 and Bi_2Te_3 are formed, and dissolve in the excess of tellurium. The study of the solidification of these solutions shows that the cryoscopic constant of tellurium is 520.—Chem. News., July 31, 1908, 60; from Compt. rend., *146* (1908), No. 26.

NITROGEN.

Nitrogen—Deduction of Atomic Weight from the Volumetric Composi-

tion of Ammonia.—Th. A. Guye and A. Pintza have determined the density of the gas N_2 and $3H_2$, obtained from the decomposition of a given weight of NH_3, and have thence calculated the atomic weight of nitrogen. Taking $O = 16$ the atomic weight lies between 14.00 and 14.02, which confirms the value 14.01 adopted by the International Commission. —Chem. News, Dec. 24, 1908, 318; from Compt. rend., *147* (1908), No. 20.

Hydrazoic Acid—Preparation.—Johannes Thiele finds that the conversion of hydrazine into hydrazoic acid by nitrous acid, by oxidation either alone or in presence of hydroxylamine, or by the action of nitrogen chloride, gives only small yields. But if ethyl nitrite is allowed to act on hydrazine in presence of alkali, good yields of sodium nitride are obtained, especially if excess of nitrite is used. Ethyl nitrite is not saponified by alkali in the cold, and the free hydrazoic acid can be obtained in aqueous solution by allowing hydrazine sulphate to react with ethyl nitrite in presence of caustic soda. Sodium nitride can also be obtained by heating hydrazine hydrate with sodium nitrite in aqueous solution. The reaction takes place slowly, and is incomplete; it is accelerated by the presence of some hydrazine sulphate, or by large quantities of sodium hydroxide.— Chem. News, Oct. 30, 1908, 222; from Ber. d. D. Chem. Ges., *41* (1908), No. 13.

Chlorazide, N_3Cl—Preparation and Properties.—According to F. Raschig, when a solution of the sodium salt of hydrazoic acid, N_3Na, is mixed with a solution of sodium hypochlorite and the mixture is acidified with a weak acid, such as acetic or boric acid, it turns yellow, and a colorless gas escapes, smelling of hypochlorous acid. The gas explodes when brought into contact with a flame or a glowing splinter. It is soluble in water, giving a yellow solution. The gas escapes from this solution at the ordinary temperature *in vacuo*, and can be collected in caustic soda; the solution thus obtained sets iodine free from potassium iodide, and bleaches litmus paper. The composition of the gas is expressed by the formula N_3Cl, and the equation showing its formation is $HOCl + N_3H = H_2O + N_3Cl$, the action being similar to that of hypochlorite on ammonia, $HOCl + NH_3 = H_2O + NH_2Cl$. When the solution of chlorazide acts on caustic soda, sodium hydrazide and sodium hypochlorite are formed.— Chem. News, Jan. 29, 1909, 59; from Ber. d. D. Chem. Ges., *41* (1908), No. 17.

Nitrites.—Detection in "Drinking Water," which see.

PHOSPHORUS.

Phosphorus—Determination in Organic Substances.—I. Bay recommends a process for the determination of phosphorus in organic substances, which is analagous to that proposed for the determination of

sulphur. The organic material is burned in a bayonet tube with sodium carbonate and magnesia. The contents of the tube are dissolved in dilute acetic acid, and the phosphorus in the solution determined by means of a volumetric solution of uranium nitrate containing 40 Gm. of the salt in the liter, and using potassium ferrocyanide as an indicator. The author has determined the phosphorus in trimethylphosphine and in triethylphosphine by the Carius method and by this new process, the figures obtained being as follows: Trimethylphosphine, 40.78 per cent. by the Carius method, and 40.67 per cent. by the new process; triethylphosphine, 26.27 per cent. by the Carius method, and 26.12 per cent. by the new process.—Pharm. Journ., Dec. 19, 1908, 804; from Compt. rend., April 13, 1908, 814.

Calcium Phosphide and Hydrogen Phosphide—Rapid Preparation.—C. Martignon and R. Tranney recommend the following rapid method of preparing calcium phosphide, and from this hydrogen phosphide in turn: Aluminum in powder is intimately mixed with calcium phosphate and heated to a dull red heat. The surface of the mixture is then touched with a little deflagrating powder, and the action thus started permeates the mass, forming alumina and calcium phosphide, according to the equation—

$$3Ca_3 2PO_4 + 8Al_2 = 3Ca_3P_2 + 8Al_2O_3.$$

The product is a brownish mass, the fresh fracture of which is reddish. Exposed to the air it decomposes, evolving hydrogen phosphide and leaving an impalpable powder as residue. By the action of water it yields this gas, accompanied by traces of hydrogen, but free from other impurities.—Pharm. Journ., Feb. 27, 1909, 272; from Compt. rend., *148* (1909), 167.

Zinc Phosphides—Formation by Direct Combination.—Two zinc phosphides, Zn_3P_2 and ZnP_2, have been obtained by P. Jolibois in a state of purity by direct combination. Molten zinc was poured on to dry red phosphorus, and the mixture heated in a Perrot furnace until no more phosphorus was given off. The melt, when cold, was found to consist of fine hexagonal crystals embedded in a matrix of zinc. This excess was removed either by distillation, or by treatment with mercury, in which the metal is much more soluble than the phosphide, or by treatment with fuming nitric acid, at 0° C. The fine hexagons thus obtained were Zn_3P_2. It distils in hydrogen at about 1100° C. When treated with dilute hydrochloric acid the gas evolved is very pure hydrogen phosphide. On heating this phosphide *in vacuo* to 400° C. with phosphorus vapor it absorbs phosphorus, and the resulting black powder has the composition ZnP_2. It is slowly attacked by strong hydrochloric acid, giving gaseous H_3P and the solid HP_2. The phosphides ZnP and Zn_3P_4 were not found

to be formed by the direct combination of zinc and phosphorus.—Pharm. Journ., Dec. 26, 1908, 840; from Compt. rend., *147* (1908), 801.

Hypophosphorous Acid — Preparation.—Dr. Gunnar Heikel recommends the preparation of hypophosphorous acid by decomposing barium hypophosphite with the exact quantity of sulphuric acid, and gives the following method for preparing (economically) a solution of pure barium hypophosphite suitable for this purpose: Calcium hypophosphite is precipitated with somewhat more than the equivalent quantity of ammonium oxalate (prepared by neutralizing oxalic scid with ammonia water). The calcium is completely precipitated as oxalate, which is perfectly insoluble in the neutral solution of ammonium hyposulphite. This solution, containing a small excess of ammonium oxalate, is filtered and the filtrate is boiled with barium carbonate in excess until the odor of ammonia has disappeared. The surplus of ammonium oxalate is also eliminated by the process, the reaction products being ammonia, carbonic acid and insoluble barium oxalate. To accelerate the reaction it is advisable to keep the mixture very concentrated, avoiding, however, an evaporation to dryness, which would cause a decomposition of the barium hypophosphite with evolution of the exceedingly poisonous phosphine-gas. The product is extracted with a large amount of water, the filtrate is concentrated, and, the strength of the solution having been determined, it is decomposed with the calculated quantity of diluted sulphuric acid, preferably in boiling hot solution. The filtrate should be absolutely free from barium and give only a slight test for sulphuric acid.—Amer. Journ. Pharm., Dec., 1908, 583–584.

Hypophosphorous Acid—Catalytic Oxidation by Copper.—J. Bongault finds that on treating sodium hypophosphite with an excess of copper sulphate (NaH_2PO_2, 2 Gms.; $CuSO_4$, $5H_2O$, 8 Gms.) in aqueous solution a brownish-yellow precipitate is obtained which appears to be cuprous hypophosphite; on boiling, the precipitate gradually becomes crystalline, and appears then to be pure metallic copper. If the hypophosphite is in excess (NaH_2PO_2, 10 Gms.; $CuSO_4$, $5H_2O$, 2 to 3 Gms.) there is first a brown precipitate, apparently hydride. On continuing the heating on a boiling water-bath, a large quantity of hydrogen is evolved and a reddish-brown precipitate collects at the surface of the liquid. This is separated and washed repeatedly with boiling water. The product thus obtained, when heated with a 20 per cent. aqueous solution of sodium hypophosphite, gives an abundant evolution of hydrogen. The hypophosphite is partially converted into phosphite and phosphate. The reaction gradually becomes slower, and finally stops before complete conversion of the hypophosphite. If the liquid decanted after this reaction is replaced by a fresh quantity of the hypophosphite solution on the boiling water-bath the evolution of hydrogen recommences. The operation may be repeated frequently, and a large quantity of hydrogen obtained by means of a small

quantity of copper. With 0.35 Gm. of copper, for example, and at four operations, a total of 4 liters of hydrogen was obtained, the copper still remaining distinctly active. In this reaction the water is apparently decomposed by the copper, yielding hydrogen, which is disengaged, and oxygen which oxidizes the hypophosphite. The action occurs better in perfectly neutral solution, rather than when slightly acid.—Pharm. Journ., May 29, 1909, 738; from Compt. rend., *148* (1909), 415.

Hypophosphoric Acid—Molecular Weight and Hydrate.—Arthur Rosenheim and Max Pritze have determined the molecular weight of hypophosphoric acid and the formula of the hydrate. For this purpose, hypophosphoric acid esters (ethyl and methyl), and pyrophosphoric acid ester were prepared by the action of alkyl iodide on silver hypo- or pyrophosphate, and their molecular weights were determined by the boiling-point method. The pyrophosphoric acid esters gave values which agreed very closely with the molecular weights of the substances of formulæ $(CH_3)_4P_2O_7$, $(C_2H_5)_4P_2O_7$, while with the same solvents the corresponding hypophosphoric esters give numbers which point to the simple formula H_2PO_3 for the acid. When a solution of free hypophosphoric acid is allowed to crystallize over sulphuric acid *in vacuo*, tabular transparent crystals are formed. They melt at 62° C., and the analysis of them shows that they are the monohydrate, $H_2PO_3.H_2O$. This monohydrate is stable between 0° and 60° C. —Chem. News, Oct. 30, 1908, 222; from Ber. d. D. Chem. Ges., *41* (1908), No. 13.

"*Phosphoric Acid*, a comparison of the volumetric methods for its estimation," is the subject of a paper by Virgil Coblentz and Otto B. May, printed in the "Proceedings" of this Association, 1908, 874–879.

Phosphoric Acid—Direct Determination.—Raben has simplified the direct determination of phosphoric acid as ammonium phosphomolybdate as follows: The precipitate of ammonium phosphomolybdate, obtained in the usual way, is collected upon a suction filter and washed with water until the washings no longer give a reaction with potassium ferrocyanide. Then, taking advantage of the solubility of ammonium nitrate in alcohol, the precipitate is washed several times with warm 70 per cent. alcohol, once with strong alcohol, and finally with a few cubic centimeters of ether. It is then dried at 110°–120° C. and weighed.—Pharm. Ztg., liii (1908), No. 89, 880; from Ztschr. f. analyt. Chem., 1908, 529.

Phosphoric Acids—Determination of Molecular Weights by Cryoscopy.—H. Giran determines the molecular weights by a cryoscopic method which depends on the following observations: In acetic solution the molecular weight of metaphosphoric acid diminishes with the time, and tends towards a limit which is lower the more dilute the solution. The molecular weight of the meta acid is 400 and the formula is $(PO_3H)_5$. The same holds good for pyrophosphoric acid, which has the formula $(P_2O_7H_4)_3$ and the

molecular weight 534. With the ortho acid the molecular weight varies with the time, all the results being included between the normal weight $PO_4H_3 = 98$ and the normal weight $(PO_4H_3)_2 = 196$. This might be interpreted by supposing that the limit is reached very rapidly. The molecular condensation of the ortho acid is the same in the liquid and solid state, and the condensation is certainly greater than 1. It is logical to conclude that the diminution of molecular condensation observed in passing from the meta to the pyro acid is continued when we pass from the pyro to the ortho acid. The last should then have a condensation lower than 3, and thus equal to 2. Thus solid or liquid orthophosphoric acid must be represented by the formula $([PO_4]H_3)_2$.—Chem. News, July 31, 1908, 60; from Compt. rend., *146*, (1908), No. 26.

Phosphoric Acid—Action on Glass.—As is well known, phosphoric acid acts upon all silica glasses, so that glass and porcelain vessels cannot be used in its concentration. K. Hüttner finds that the chief product of the action of concentrated phosphoric acid on glass is SiP_2O_7, and at the same time the metaphosphates of sodium, potassium, and the phosphates of calcium and aluminum. Dry phosphorus pentoxide, however, has no action on glass.—Apoth.-Ztg., xxiii (1908), No. 65, 580; from Ztschr. anorg. Chem., *59* (1908), 216.

Calcium Phosphate, B. P.—Perplexing Definition and Test.—W. H. Simmons and L. J. Morson call attention to the perplexing conditions arising from the present definition of calcium phosphate in the B. P., 1898. This authority admits both calcium orthophosphate ($Ca_3[PO_4]_2$), obtained by precipitation from acid solution of bone ash with ammonia, and dicalcium phosphate ($CaHPO_4 2H_2O$), obtained by the interaction of sodium phosphate and calcium chloride, but retains the test applied in the previous edition of the B. P. to the orthophosphate for both products, which should indicate not less than 95 per cent. of pure anhydrous calcium phosphate. Obviously, a salt having the formula $CaHPO_4 2H_2O$ cannot contain as much as 95 per cent. of pure *anhydrous* salt; but it has been shown by Cameron and Seidell that even the normal tricalcium phosphate undergoes considerable decomposition when treated with pure distilled water, a certain amount of lime and phosphoric acid going into solution; and the authors have been able to confirm the statement that calcium orthophosphate always contains an excess of either base or acid. Moreover, they find this also to be the case with the dicalcium salt, as will be seen by comparing the following figures:

—	Bone-ash Phosphate.		Dialcium Phosphate.	
	Found.	Theory $Ca_3(PO_4)_2$.	Found.	Theory $CaHPO_4 2H_2O$.
CaO	41.8 per cent.	54.2 per cent.	37.5 per cent.	32.5 per cent.
P_2O_5.	44.3 per cent.	45.8 per cent.	42.9 per cent.	41.2 per cent.
H_2O.....	—	—	19.9 per cent.	20.9 per cent.

It appears, therefore, that any method of examination, to be of much value, should include the separate determination of the lime and of the phosphoric acid, and the authors suggest that this should be substituted for the present unsatisfactory test in the next edition of the B. P. Furthermore, there is no apparent necessity for the acid and normal calcium phosphates to be both included in the same monograph under the same name. It might be better to omit the calcium orthophosphate altogether, and employ only the dicalcium phosphate in medicine, as recommended by Hager.—Chem. & Drugg., Nov. 21, 1908, 787.

BORON.

Boron—Improved Method of Crystallization.—Kühne stated that silicon and boron are obtained in the crystalline form if their oxides are burnt with aluminum and sulphur; part of the aluminum forms sulphide, and thus sufficient heat is generated to decompose the oxide with the rest of the aluminum. The boron crystals are then said to be easily isolated from the aluminum sulphide. Heinrich Biltz has now repeated Kühne's experiments, and by an improvement of the method has obtained black crystals resembling those described by Wöhler and Deville in 1857. These authors obtained, besides the black crystals, clear yellow or brown crystals containing boron, aluminum and carbon. They regarded the two crystalline forms as essentially identical, and thought they were elementary boron, containing carbon and aluminum as impurities. The author's experiments have shown that in the black crystals a chemical compound, an aluminum boride of formula AlB_{12}, is present.—Chem News, Oct. 16, 1908, 198; from Ber. d. D. Chem. Ges., *41* (1908), No. 12.

Boron Nitride—Preparation from Boron Bromide.—Alfred Stock and Walter Holle prepare boron nitride from boron bromide, which can be obtained comparatively easy in the pure state. The boron bromide reacts with ammonia, giving ammonium bromide and borimide, $BBr_3 + 6NH_3 = B(NH_2)_3 + 3NH_4Br$. Borimide is converted on heating into boron nitride. It is best to allow the bromide to drop into excess of liquid ammonia, and special precautions have to be taken in order that the tube

through which the bromide is introduced does not become stopped up when it reaches the atmosphere of ammonia.—Chem. News, July 24, 1908, 47; from Ber. d. D. Chem. Ges., *41* (1908), No. 10.

Calcium Boride—New Method of Preparation.—Having found that the boron obtained from magnesium and boron trioxide was not pure enough to be used for making the boron bromide necessary for their synthesis of "boron nitride" (which see), Alfred Stock and Walter Holle endeavored to prepare the element by reducing boron trioxide with calcium. At a dark red heat, however, this reaction does not lead to the formation of boron, but of almost pure calcium boride.—Chem. News, July 24, 1908, 47; from Ber. d. D. Chem. Ges., *41* (1908), No. 10.

SILICON.

Precipitated Silica—Questionable Existence of a Hydrate.—Henry Le Chatelier remarks that silica loses all its water at 100° C. under atmospheric pressure, or at the ordinary temperature in a vacuum. Hence its hydrates, if they exist, are not stable. It is known that a hydrate at temperatures at which it is stable has a tension of efflorescence lower than the vapor tension of pure water, but this vapor tension increases more rapidly than that of water, and at a certain temperature, which is generally lower the less stable the hydrate is, the substance and water have exactly the same vapor tension. Above this temperature the hydrate is not stable. The temperature is 32° C. for sodium sulphate and 150° C. for calcium sulphate. Gelatinous silica, on the other hand, keeps the same appearance and consistency even after it is heated to 320° C., whereas the destruction of a hydrate would be detected by a change in the appearance of the material. The only plausible explanation is the assumption that silica does not form hydrates, but always exists in the anhydrous state. Precipitated silica is in a state of fine division, and forms pastes of variable consistency with water. It would readily pass through filter paper, although insoluble in water.—Chem. News, Nov. 20, 1908, 258; from Compt. rend., *147* (1908), No. 16.

Kieselguhr—Superiority as a Filtering Medium.—Chas. H. LaWall records the results of some comparative experiments made in order to determine the relative absorptive value of kieselguhr and a number of other substances usually employed as filtering media so that it could be expressed numerically. Ten Gm. of each of the substances, in fine powder, was mixed with water gradually until a stiff paste resulted, from which the water would not separate on tilting the beaker and pouring. In this way the following figures were obtained:

Talcum	15 Cc.
Precipitated calcium phosphate	18 Cc.
Pumice	20 Cc.
Kieselguhr	40 Cc.
Magnesium carbonate	50 Cc.

It will thus be seen that with the exception of the magnesium carbonate, which is ruled out from most filtering operations on account of its alkalinity, kieselguhr has an absorptive power of at least double that of any of the other substances. As it is not necessary to purify it with hydrochloric acid, as is done with talc, it is always found to be neutral in reaction and free from soluble matter. Comparative experiments on the aromatic waters have shown that it has the advantage over talc of being more absorbent and of not passing through the filter to give the first portion of the filtrate a cloudy appearance. In cost, it is about 50 per cent. higher than talc, although its comparative bulk is so much greater that a pound of kieselguhr will perform more actual work in filtering than two pounds of talc.—Proc. N. J. Pharm. Assoc., 1908, 47–48.

Silicon Acids—Production and Derivatives.—The experiments of Wilhelm Melzer determine, that when a molecule of magnesium halogen alkyl acts on silicon tetrachloride, silicon alkyl trichlorides are formed: $RMgX + SiCl_4 = RSiCl_3 + MgXCl$ (where R denotes an alkyl and X a halogen). These are converted into the corresponding silicon acids of the type R.SiOOH by water, and into orthosilicon acid esters of the type $R.Si(OC_2H_5)_3$ by alcohol. Every trace of moisture must be avoided, especially in experiments with chlorides. By this method the author has prepared various alkyl silicon haloids, *e. g.*, silicon propyltrichloride, $C_3H_7.SiCl_3$, a clear liquid fuming in air and possessing a piercing smell, and also silicon acids, *e. g.*, silicobutyric acid, $C_3H_7.SiOOH$, and their esters.—Chem. News, Dec. 4, 1908, 281; from Ber. d. D. Chem. Ges., *41* (1908), No. 14.

"*Monox*" (*Silicon Monoxide*)—*A New Chemical Compound.*—It is claimed that on heating silicon and silica together to a temperature of 1700°–1800° C., active reaction occurs, with the formation of SiO. This silicon monoxide has properties which render it valuable for technical application; it has, therefore, been given the trade name of "monox." It occurs as a very light, bulky, fine, velvety, brown powder; subliming at 1700° C. without melting; it is a very bad conductor of heat and of electricity, and will therefore prove valuable as an insulating packing. It mixes well with, and is easily suspended in fluids, and as it is unaffected by the air, it forms an excellent pigment basis for paint; wood, stonework, and iron exposed to the weather last well when painted with it; it may also be used for giving body to printing inks, and to certain ceramic pastes. From its extreme fineness, it may be used as a lubricant when suspended in oil, and it also serves as a good polishing medium.—Pharm. Journ., Sept. 12, 1908, 299; from L'Union Pharm., 1908, *49*, 347.

Hydrogen Silicides—Numerous Forms.—In 1902 Moissan and Smiles found that SiH_4 produced by the action of hydrochloric acid on magnesium silicide, is accompanied by another silicide, which is spontaneously

inflammable on contact with air. P. Lebeau now finds that by freezing with liquid air the gases liberated in the above manner from magnesium silicide, and slowly fractionating them, they were separated into pure non-inflammable SiH_4, and a violently detonating gaseous mixture. On re-refractionation the latter was separated into a gas and a colorless liquid. The gas proved to be silicoethane, Si_2H_6, density 2.18, boiling at about $-7°$ C. Although it has not been obtained non-inflammable the differences observed in the modes of combustion indicate that this property is due to an impurity. The liquid residue was small in quantity and difficult to manipulate on account of its explosive nature. It is to this that the other two gases owe their inflammability. It is, probably, silico-ethylene, Si_2H_4. Besides these compounds a fourth, a solid very unstable substance, turning brown in the air and leaving silicon, was obtained. This may be similar to Ogier's silicon hydride. These results indicate that silicon compounds are more numerous than was at one time supposed.—Pharm. Journ., Jan. 30, 1909, 120; from Compt. rend., *148* (1909), 43.

CARBON.

Graphite—Solubility in Decacyclene ($C_{36}H_{18}$).—J. Ostromysslenski has discovered an organic solvent for graphite. Starting with the hypothesis that hydrocarbons of high molecular weight would be most likely to possess this property, he has found that decacyclene, $C_{36}H_{18}$, formed by the action of sulphur on acenaphthene, is such a solvent. Decacyclene melts at 402° C.; when 6 Gm. of it was melted with 0.256 Gm. of Ural graphite the latter completely dissolved in ninety minutes, and 1.2316 Gm. of Nertschenk graphite dissolved in 11 Gm. of decacyclene in five hours at 485° C. The graphite solution was completely opaque and black in color.—Pharm. Journ., Aug. 29, 1908, 258; from Schweiz. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 32, 507.

Lampblack—Commercial Inferiority.—D. B. Dott, having occasion to prepare a little black varnish, purchased some "lampblack," which did not seem intensely black and had a gritty "feel." Examination proved this sample to yield 72.4 per cent. of ash, consisting largely of phosphate of lime, with magnesia, silica, etc., thus indicating that the black consisted mainly of animal charcoal. Another sample from a wholesale oil and color store gave 69.6 per cent. of ash of similar composition. It would be interesting to know if this kind of black is generally sold as "lampblack." The question might arise whether it is a correct legal description.—Chem. & Drugg., Oct. 17, 1908, 622.

Carbon Tetrachloride—Purification of Commercial Product.—Recommending carbon tetrachloride as solvent in determinations of the iodine number of oils, Levi and Manuel observe that the commercial tetrachloride requires purification, which is conducted as follows: An adequate quantity of the tetrachloride is shaken in a separatory funnel with sodium

thiosulphate solution, at intervals of half an hour during 1½–2 hours. It is then separated from the thiosulphate solution and shaken with a 5 per cent. solution of NaOH at intervals of a quarter of an hour during one hour. The separated tetrachloride is now dried with calcium chloride and finally distilled.—Pharm. Ztg., liv (1909), No. 28, 281; from Journ. Amer. Leath. Chem. Assoc., Dec., 1909.

Carbon Tetrachloride—Detection of Carbon Disulphide.—Radcliffe recommends the following method for the detection of carbon disulphide in carbon tetrachloride: 25 Cc. of alcoholic KOH are carefully weighed in a loosely corked flask; 1 Cc. of the tetrachloride of carbon is then run into the flask and also carefully weighed. The mixture is then faintly acidulated with dilute acetic acid, using phenolpthalein as indicator; whereupon water is added, and, after cooling, dry sodium bicarbonate in excess. The milky-turbid liquid so obtained is then titrated in the usual way with $\frac{N}{10}$ iodine solution. The reactions are explained by the author as follows:

1. $KOH + C_2H_5OH + CS_2 = C_3H_5KOS_2 + H_2O$.
2. $C_3H_5KOS_2 + CH_3COOH = C_3H_6OS_2 + CH_3COOK$.
3. $C_3H_6OS_2 + I_2 = 2C_3H_5OS_2 + 2HI$.

—Pharm. Ztg., liv (1909), No. 45, 442; from Journ. Soc. Chem. Ind., *28* (1909), 229.

CYANOGEN.

Hydrocyanic Acid—Formation by the Action of Nitric Acid on Phenols and Quinones.—A. Seyewetz and L. Poizat have made the observation that boiling 20 per cent. nitric acid oxidizes many aromatic compounds, setting free hydrocyanic acid. This action takes place only in presence of a phenol or quinone group, and it is only those compounds which have the para-position free, or the two ortho-positions free, which liberate HCN. Nitrous acid is also always formed, and substances which destroy nitrous acid, *e. g.*, urea or aniline, stop the formation of hydrocyanic acid. The nitrous acid first yields a para- or ortho-nitroso-derivative, and then oxidation occurs at the double bond, and mesoxalic acid and the oxime of the acid are formed, or else carbon dioxide, oxalic acid, and the monoxime of dioxytartaric acid. The mesoxalic or oxalic acids then give up carbon dioxide, and the oxime condenses, evolving hydrocyanic acid.—Chem. News, March 5, 1909, 118; from Compt. rend., *148* (1909), No. 5.

Hydrocyanic Acid—Improvement of Old Method of Estimation.—Guérin and Gonet propose a method for the volumetric estimation of hydrocyanic acid, which is based on the copper sulphate method recommended by Buignet in 1859 and long rejected because of the difficulty to recognize the end reaction. Preliminarily, the authors have determined that 23.09 Gm. of copper sulphate do not, as stated by Buignet, correspond to 10 Gm. of cyanogen hydride, but to only 7.49 Gm., as is evident from the following equation:

$$CuSO_4 + 3NH_4CN = (NH_4)_2SO_4 + [Cu(CN)_2.NH_4.CN].$$

In accordance with this view, 30.81 Gm. of copper sulphate are required for the volumetric solution (= 1000 Cc. ? Rep.), and 0.1 Cc. of this corresponds to 0.001 Gm. of HCN. The titration is made by adding to 25 Cc. of the liquid under examination in an Erlenmeyer flask, 75 Cc. of water and 10 Cc. of ammonia water; then dissolving 0.5 Gm. of sodium sulphate in the mixture, and adding copper sulphate solution from a burette, rotating the flask, until a permanent blue coloration results. On multiplying the number of cubic centimeters consumed by 40, the number of milligrams HCN contained in 100 Cc. of the original liquid is ascertained.—Pharm. Ztg., liv (1909), No. 19, 187; from Journ. de Pharm. et Chim., 1909, No. 5.

Diluted Hydrocyanic Acid—its deterioration—is the subject of a paper by Virgil Coblentz and Otto May, printed in the "Proceedings" of this Association, 1908, 879–881.

Potassium Ferro- and Ferri-Cyanides—Production of Non-Toxic Green Coloring Compounds.—D. Monteil finds that green coloring bodies that are practically non-toxic can be cheaply produced from potassium ferro- and ferricyanides, which may with advantage be used in certain industrial processes.

Ferrocyanide Green, a compound of indefinite composition, is obtained as follows: Potassium ferrocyanide, one molecular weight, and boric acid 3 molecules are heated together in water to 100° C. When the liquid becomes pale green and shows an abundant precipitate, 1 molecule of picric acid is added. The color deepens and the precipitate redissolves. On evaporating and cooling brilliant green crystals are obtained. The color is decomposed by alkalies, and iron salts cannot be used to mordant it. It dyes wool and cotton, which acquire a pale green tint. With wood the color is deeper. If mononitrophenol is used instead of trinitrophenol a deeper color is obtained. The new coloring matter may be used to replace malachite and copper arsenite.

Ferricyanide Green, which crystallizes in brilliant agglomerated scales, is obtained by substituting potassium ferricyanide for the ferrocyanide in the above process. It has a very deep blackish-green color, and dyes fabrics of an olive-green and wood a very deep shade. In using them, the proportions indicated, the molecular weight of either ferro- or ferricyanide to 500 Cc. of water, should be adhered to. Long heating should be avoided or the colors are decomposed.—Pharm. Journ., Aug. 29, 1908, 258; from Repértoire [3] *20* (1908), 352.

Mercuric Oxycyanide—Extemporaneous Preparation of its Solutions.—E. Rupp and F. Lehmann recommend the following process for the preparation of a 1 per cent. solution of mercuric cyanide: Mercuric chloride, 5.8 Gm. and mercuric cyanide, 5.4 Gm., are dissolved in about 800 Gm. of distilled water. Normal potassium or sodium hydroxide solution, 44.8

Gm., are added, and sufficient distilled water to make 1,000 Gm. The solution contains 1 per cent. of mercuric oxycyanide, 0.25 per cent. of sodium chloride, or 0.32 per cent. of potassium chloride.—Apoth. Ztg., xxiii (1908), No, 87, 793–795.

ALKALIES.

Alcoholic Caustic Potash—Preparation.—Franz Rabe, in view of the necessity to avoid heat as much as possible in the preparation of alcoholic caustic potash, recommends that the caustic potash be dissolved in the least possible amount of water, and the cold solution then be poured into alcohol. On gently mixing, colorless oily drops begin to separate out; after one or two days the supernatant liquid should be decanted and preserved in a stoppered white glass bottle. Prepared in this way the solution does not turn yellow, since the potassium carbonate which is insoluble in alcohol precipitates any aldehyde or fusel oil present; it is therefore, moreover, unnecessary to use specially purified alcohol.—Pharm. Journ., Sept. 19, 1908, 334; from Ztschr. f. Unters. d. Nahr.-u. Genussm., *15* (1908), 730, 731.

Alcoholic Potash—Method of Decolorizing.—A. Halla found that alcoholic potash which was slightly discolored became bleached on exposure to diffused daylight, and accordingly recommends the following procedure: Thirty Gm. of pure stick potash are placed in a bottle with 1 liter of 95 per cent. alcohol at atmospheric temperature, the bottle being shaken from time to time; when solution is effected the clear supernatant liquid is carefully syphoned off into another bottle which is stoppered and placed in a window so as to be exposed to diffused daylight; the solution is thereby decolorized and remains so as long as it is kept exposed to daylight.—Pharm. Journ., Oct. 24, 1908, 516; from Chem. Ztg., *32* (1908), 890.

Sodium Bicarbonate—Dissociation.—M. Soury finds that the dissociation of sodium bicarbonate is not analogous to that of chalk, since two gases are formed, carbon dioxide and water, and thus there are three constituents and four phases. When the bicarbonate moistened with water is decomposed at 100° C., and the vapor tension is determined, it is found that if increasing quantities of carbon dioxide are removed the tension decreases in proportion to the amount of carbon dioxide removed. There are two periods of fixed tensions. At first the lower carbonate dissolves in the water, and when the solution is saturated the new carbonate crystallizes in contact with the liquid, giving the fourth phase indispensable for the existence of the fixed tensions. The second series of fixed tensions occurs when the carbonate first formed, $3Na_2O.4CO_2.5H_2O$, dissociates in presence of the neutral monohydrated carbonate $Na_2O.CO_2H_2O$. Chem. News, Jan. 15, 1909, 35; from Compt. rend., *147* (1908), No. 24.

Ammonia—Production from Atmospheric Nitrogen by Means of Peat.—H. C. Woltereck has communicated to the British Association (Dublin,

1908) that the production of ammonia from atmospheric nitrogen is now successfully accomplished by the agency of peat in a large plant erected for the purpose at Carnlough, county Antrim, in Ireland. Starting from an observation that a mixture of nitrogen and hydrogen passed over reduced iron at a low heat always produced ammonia for some time, further experiments developed that the presence of oxygen and water was of importance. This led to the gradual reduction of the quantity of hydrogen, and finally to its complete omission; but the periodical necessity of reducing the iron used for the purpose of moist oxidation led the author to employ some carbonaceous material—coke, coal, charcoal, etc.—for this purpose. Finally, peat was found to give the most satisfactory and rapid results, and even when it contained up to 80 per cent. of water it could still be used advantageously. Simultaneous experiments proved the co-operation of atmospheric nitrogen.—Pharm. Journ., Sept. 12, 1908, 300.

Lithium—Wide Distribution in Ores and Minerals.—Referring to a recent statement of Sir William Ramsay, that sodium and potassium are much more widely distributed than lithium, and lithium is an unlikely constituent of dust, glass, copper, etc., Professor W. N. Hartley, in a paper read before the British Association (Dublin, 1908), says that in his experience these two statements require modification. He and Mr. Ramage found in 170 common ores and minerals, potassium and sodium, and with these common elements, rubidium and lithium were very generally associated. Thus of 62 iron ores, 61 contained rubidium, in 16 red haematites of the purest type, rubidium was contained in 4, and where potassium and rubidium occurred lithium was invariably found. It was found in limestones, in dust, in the Bessemer flame, in ordinary pipe-clay, tobacco pipes, and a variety of silicious minerals, such as the Dublin granites; in Donegal kyanite, and in asbestos. It was found in dust which fell from the clouds, in volcanic dust, in soot, in flue-dust from chemical works, and in that from copper smelting and refining works. While, therefore, it is true that potassium and sodium are more abundantly distributed than lithium, upon the evidence cited it is impossible to corroborate the statement that are more widely distributed elements than lithium, or that lithium is an unlikely constituent of dust, glass, copper, etc.—Pharm. Journ., Sept. 12, 1908, 299.

Lithium Chloride—Separation by Means of Pyridine from the Alkali Chlorides.—L. Kahlenberg and F. C. Krauskopf have demonstrated that, while the chlorides of sodium, potassium, rubidium, caesium (and barium) are insoluble in pyridine containing less than 5 per cent. of moisture, lithium chloride is quite soluble even in anhydrous pyridine. In consequence, lithium chloride may be separated quantitatively from other alkali chlorides by using pyridine as the solvent. The aqueous solution of the mixed chlorides obtained in the course of analysis is evaporated to dryness, and the residue, weighing 2 Gm. or less, is boiled for a few minutes

with 25 Cc. of pyridine, breaking up any large crystals during the process. The residue is allowed to subside and the liquid decanted through a small filter, which, with the residue, is washed twice with boiling pyridine. The insoluble residue is dissolved in a little water, again evaporated to dryness, and the extraction with hot pyridine repeated. The bulked pyridine filtrates are then evaporated in a tared capsule, the lithium chloride left is converted into sulphate and weighed as such. The other chlorides are redissolved, evaporated to dryness, and weighed.—Pharm. Journ., Aug. 1, 1908, 112; from Journ. Amer. Chem. Soc., *30* (1908), 1104.

Caesium Sub-Oxides—Four Definite Compounds.—E. Rengade observes that the fusibility curves of mixtures of varying proportions of caesium monoxide and the metal show that there are at least four definite compounds containing less oxygen than the monoxide, Cs_2O. The formulas of these compounds are Cs_7O, Cs_4O, Cs_7O_2, and Cs_3O. Nearly pure crystals of the sub-oxide, Cs_7O_2, were isolated. These formulas are incompatible with the monovalence which is generally regarded as characteristic of the alkali metals.—Chem. News, June 18, 1909, 299; from Comp. rend., *148* (1909), No. 18.

ALKALINE EARTHS.

Lime—Solubility in Water at Different Temperatures.—Dr. G. T. Moody and L. T. Leyson have determined the solubility of lime (CaO) in water at different temperatures, under certain precautions and conditions, to insure accurate figures. The results, which were obtained by direct titration, are shown in the following table:

Temperature.	Grams of Water containing 1 Gm. of CaO.
2°.	768.5
10°.	786.8
15°.	804.3
20°.	826.4
25°.	868.7
30°.	908.2
40°.	988.1
50°.	1083.0
60°.	1179.0
70°.	1274.8
80°.	1368.1

—Chem. & Drugg., Jan. 30, 1909, 168.

Quick Lime—Estimation in Presence of Carbonates.—Poepel recommends the following simple method for determining quick lime, which is particularly adapted to mixtures with carbonate: A weighed quantity of the substance is boiled with neutral solution of an ammonium salt—preferably ammonium chloride—and the liberated ammonia gas is conducted

into a measured quantity of volumetric solution of sulphuric acid. The amount of acid consumed is then ascertained by titration, and from the figures so obtained the amount of CaO, corresponding to the ammonia liberated, is readily calculated. To determine the amount of calcium carbonate in the sample, this is directly titrated with volumetric acid and the amount of CaO, ascertained as above, is deducted.—Pharm. Ztg., liii (1908), No. 89, 879; from Ztsch. f. angew. Chem., 1908, No. 40.

Nowicki questions the availibility of Pöpel's method for the estimation of quick lime in the presence of carbonate and gives experimental data which prove that calcium carbonate is by no means indifferent in its action on ammonium chloride. This is true both for precipitated and for natural carbonate. The amount of ammonia disengaged in the presence of carbonate depends on the period of boiling.—Pharm. Ztg., liii (1908), No. 98, 972; from Ztschr. f. angew. Chem., 1908, No. 45.

Barium Sulphate—Colloidal Form.—A Recoura finds that if barium sulphate is formed by double decomposition in glycerin, water can be added to dilute the glycerin without causing the precipitation of the sulphate. Furthermore, if the barium sulphate is obtained by neutralizing a solution of sulphuric acid with barium ethylate, the colloidal substance can be obtained free from any electrolyte. The stability of a colloidal solution of barium sulphate is much increased by the addition of barium chloride or nitrate, and many electrolytes have no action upon the colloidal solution when barium salts are present, although they coagulate the pure solution of colloidal barium sulphate.—Chem. News, July 24, 1908; from compt. rend., *146* (1908), No. 24.

Strontium Salts—Method of Securing Freedom from Barium.—H. Caron and D. Raquet found on an examination of 50 samples of strontium salts met with in French commerce only 5 samples that were pure, 6 containing more than 1 per cent. of barium and another 6 over 2 per cent. After criticizing the official method in the supplement of the French Codex for the removal of barium from strontium salts, and the unnecessarily complicated method described in the Codex, the authors suggest the following improved method which secures perfectly pure barium-free strontium salts: To a 10 per cent. solution of commercial strontium nitrate add a tenth of its volume of 3 per cent. neutral potassium chromate solution; after twenty-four hours filter out any precipitate and pour the filtrate, which should be distinctly yellow, into excess of 10 per cent. sodium carbonate solution. Wash the precipitated strontium carbonate by decantation, then collect and dry. The official test of the French Codex for the purity of strontium carbonate is also unsatisfactory. It is directed to be performed with solution of strontium chromate in presence of a slight excess of free acetic acid; it should be applied in a neutral solution, preferably obtained with hydrochloric acid thus: To 10 Cc. of

10 per cent. hydrochloric acid add excess of strontium carbonate, filter, and make up the volume of the filtrate to 20 Cc., to this add 2 Cc. of 3 per cent. solution of potassium chromate. No precipitate should be formed, even after several hours.—Pharm. Journ., July 11, 1908, 36; from Répertoire, *20* (1908), 241.

Strontium Bromide—Satisfactory Quality Supplied by American Manufacturers.—Ambrose Hunsberger has taken pains to investigate whether the unequivocal statement made, and reiterated in many quarters, that the chemical manufacturers of the United States do not supply a grade of strontium bromide corresponding to the requirements of the U. S. P., is justified by the facts. It is alleged that all domestic makes of this salt are contaminated with barium to such a degree as to entirely preclude their use as a therapeutic agent, the percentage of the contaminating substance being so large as to provoke gastric disturbances of the most alarming nature, with pronounced toxic symptoms on the side. By correspondence with the five largest manufacturers of medicinal chemicals in the United States, and by subjecting samples of strontium bromide manufactured by these firms, quietly purchased on the open market while awaiting replies, to chemical examination, Mr. Hunsberger has demonstrated to his satisfaction that the statement concerning the presence of barium in strontium bromide of American manufacture is absolutely without foundation, and was evidently made and circulated in the interests of the foreign firm whose particular make has been successfully exploited since it was clinically demonstrated that the strontium bromide is more readily tolerated than the bromine compounds of potassium and sodium, and in this probably lies the reason for the vaunted superiority of the imported strontium bromide. This salt was first brought to the attention of the medical profession in France about 1891, and exploited by a foreign firm of chemists as being superior to the older potassium and sodium bromides, but this claim of superiority is based on the comparison of a strontium salt with a potassium salt, and not on the comparison of a foreign strontium salt with a domestic strontium salt.—Proc. Penna. Pharm. Assoc., 1908, 164–168.

EARTHS.

Aluminum Powder—Analysis.—To determine the amount of aluminum existing as metal in commercial aluminum powder, E. Kohn-Abrest proceeds as follows: 0.5 Gm. to 1 Gm. of the thoroughly cleansed powder, dried *in vacuo*, is treated with a large excess of ferric sulphate, free from ferrous salt (about 25 Gm. to 30 Gm.). The whole is introduced into a suitable flask with 75 Cc. of water, the flask immersed in boiling water, and a current of carbon dioxide driven through the liquid continuously. In about ten minutes the aluminum will have disappeared, a brown transparent solution being formed. Finally, 20 Cc. of sulphuric acid and water is added to the contents, the whole cooled in a current of carbon dioxide,

and the ferrous salt determined in a diluted portion of the liquid by means of a permanganate solution containing 3.14 Gm. per liter. One Cc. of the permanganate solution is equivalent to 0.000895 Gm. of aluminum. The reaction is expressed thus: $3Fe_2(SO_4)_3 + 2Al = Al_2(SO_4)_3 + 6FeSO_4$. —Pharm. Journ., March 27, 1909, 424; from Compt. rend., Dec. 14, 1908, 1293.

Fused Amorphous Alumina—Production of Artificial Sapphires from it. —Louis Paris finds that when oxides capable of giving a blue coloration are added to alumina fused before the blowpipe flame no coloration is produced. The oxides float on the surface of the alumina, without mixing with it or coloring it. If, however, the alumina used is not chemically pure but contains some hundredths of a foreign oxide (*e. g.*, lime), cobalt gives a blue coloration, and the optical properties of the alumina show that the latter is not crystalline but amorphous. The specimens of colored alumina thus produced so closely resemble sapphires that even experts have been unable to distinguish them from the naturally occurring gems. With nickel yellow specimens have been obtained which rival the Ceylon sapphire.—Chem. News, Dec. 24, 1908, 318; from Compt. rend., *147* (1908), No. 20.

Clay—A Serviceable Luting Material.—F. Kraze observes that ordinary clay, moistened with sufficient water to a plastic mass, forms an excellent luting material for the tube connections, stoppers, etc., in all cases in which it is customary to use paraffin and the like. It has the advantage over these also in its greater resistance to heat.—Apoth. Ztg., xxiii (1908), No. 73, 659; from Chem. Ztg., 1908, p. 819.

Gil-i-Armeni—An Edible and Medicinal Earth.—David Hooper describes "Gil-i-Armeni," a form of edible and medicinal earth frequently met with in India and brought from the Persian Gulf ports. It is the so-called "Armenian Bole" of European commerce, and is prescribed by Tamil doctors as an astringent in fluxes of long standing, and supposed to have considerable efficacy in malignant fevers. The present sample was forwarded by the Consul-General of Khurasan, Meshid, as an edible earth. Its composition is that of a ferruginous clay.—Pharm. Journ., Aug. 8, 1908, 161.

RARE EARTHS.

Rare Earths—Relation of Magnetism to their Atomic Weights.—B. Urbain and G. Jantsch observe that if the rare earths are arranged in order of their atomic weights their magnetism is found to exhibit two maxima, one in the cerium and the other in the yttrium group. Lanthanum is diamagnetic, praseodymium is paramagnetic, but less so than neodymium, which is five times as magnetic as samarium. Europium is much less magnetic than gadolinium, and the magnetism increases from gadolinium to terbium and from terbium to dysprosium. It is interesting to notice

that, by the isomorphism of its salts of the same type, bismuth, which is diamagnetic, comes between the last term of the cerium series (samarium) and the first term of the yttrium series (europium).—Chem. News, Jan. 15, 1909, 35; from Comp. rend., *147* (1908), No. 24.

Scandium—Source, Characters and Compounds.—Sir William Crookes observes that scandia is one of the rarest and least known of the recognized rare earths. It was discovered in 1879 (see Proceedings, 1879, 345) by Nilson, who separated it, with ytterbia, from erbia extracted from euxenite and gadolinite. Several years ago the author commenced an examination of all the obtainable rare-earth minerals, in order to see if any of them showed more than a trace of scandium. Of these minerals scandium was detected in auerlite, cerite, cryptolite, keilhauite, koppite, mosandrite, orangite, orthite, pyrochlore, thorianite, thorite, urdite and wiikite. But while the other minerals contained less than 0.01 per cent. of scandium, wiikite was found to contain more than one hundred times that amount, and this mineral is the source of the scandium used in the author's present experiments.

Wiikite, so named after Professor Wiik, of Helsingfors, is a black amorphous mineral found with monazite in a felspar quarry at Impilake, Lake Ladoga, Finland. On comparison with a large number of typical rare-earth minerals, it most resembles yttrotantalite in appearance. Its composition varies somewhat in different samples of the mineral, but the following is considered a fair approximation of the composition of a typical specimen: Tantalic acid with some niobic acid, 15.91; titanic acid and zirconia, 23.36: earths of the cerium group, 2.55; earths of the yttrium group, 7.64, *scandia, 1.17;* thoria, 5.51; ferrous oxide, 15.52; uranic oxide, 3.56; silica, 16.98; water and gases, 5.83; calcium, manganese, tin, sulphur, etc., unestimated, 1.97 per cent. After a detailed description of preparing

Scandium from Wiikite, the author mentions that the easy decomposition of the nitrate by heat makes it possible by a systematic series of fractionations to separate the scandium from most of the associated elements —the worst being ytterbium, the nitrate of which is almost as easily decomposed. Fortunately a strong dominant line of the ytterbium spectrum, wave-length 3694.344, occurs at a vacant part of the scandium spectrum, and near the characteristic group of scandium.* A sample of scandia is not considered satisfactory if the least trace of this line is seen on an over-exposed spectrum of scandium, and if the atomic weight (of scandium) is higher than 44.1—the atomic weight of ytterbium 173, and consequently a very little of it as an impurity raises the atomic weight of scandium. The author has prepared and experimentally determined the composition of the following compounds:

* This voluminous paper is accompanied by a two-page photographic plate, illustrating the scandium spectrum in selected groups of characteristic lines.

Scandium Hydroxide, $Sc_2O_3.2H_2O = Sc(OH)_2$. A hard, porcelain-like mass, readily soluble in dilute acids. A very weak base.

Scandium Carbonate, $Sc_2(CO_3)_3.12H_2O$. A white precipitate, holding carbonic acid very weakly, and losing a portion on drying at 100° C., with formation of a basic salt of uncertain composition. May be dried in a current of air at the ordinary temperature without decomposition.

Hydrated Scandium Chloride, $Sc_2Cl_6.12H_2O$. A felt-like mass of fine white needles. Somewhat deliquescent, and readily soluble in alcohol.

Hydrated Scandium Bromide, $Sc_2Br_6.12H_2O$. Small rhombic crystals, slightly brown by free bromine, and very deliquescent.

Scandium Fluoride, Sc_2F_6. A fine white precipitate, anhydrous when dried over sulphuric acid.

Scandium Chlorate, obtained in long needles of uncertain composition.

Scandium Perchlorate, obtained in the form of a felt-like mass of rhombic needle-shaped crystals.

Scandium Bromate, obtained as an amorphous gummy mass.

Scandium Sulphate, $Sc_2(SO_4)_3.6H_2O$. Obtained as a viscous oily mass—difficult to crystallize without loss of water.

Anhydrous Scandium Sulphate, $Sc_2(SO_4)_3$. Obtained when the hydrous sulphate is heated to 250° C. When heated to dull redness it loses one molecule of SO_3 and becomes a basic salt $= S_2O(SO_4)_2$.

Scandium and Potassium Sulphate, $3K_2SO_4.Sc_2(SO_4)_3$. Dissolves with difficulty in water, even boiling, and is insoluble in a saturated solution of potassium sulphate.

Scandium Selenate, $Sc_2(SeO_4)_3.8H_2O$. Forms well-defined rhombic prisms, bright, colorless, and capable of withstanding a temperature of 400° C. without decomposition, except loss of water.

Scandium Nitrate, $Sc(NO_3)_3.4H_2O$. Very soluble in water and in alcohol, and is extremely deliquescent. A neutral aqueous solution evaporated on the water-bath, deposits colorless prismatic crystals on cooling. Decomposes more easily by heat than the nitrate of any other of the rare earths. When heated gradually in a silica crucible, it fuses, boils, becomes opaque and evolves water, and anhydrous nitrate [$Sc(NO_3)_3$] is obtained if the heating is properly intercepted. If continued, nitrous vapors come off, the liquid becomes clear, like water; then, on increasing the heat, brown, and finally a white opaque residue of scandia remains.

Scandium Formate, $(HCOO)_2ScOH.H_2O$. Hard and lustrous crystals, easily soluble in hot water and in alcohol.

Scandium Acetate, $(CH_3COO)_2ScOH.2H_2O$. Fine white crystals, with difficulty soluble in water.

Scandium Propionate, $(C_2H_5COO)_2ScOH$. A voluminous white powder,

sparingly dissolved by cold water (1.23 p. in 100), easily soluble in alcohol.

Scandium Butyrate, $(CH_3.CH_2.CH_2.COO)_2ScOH$. A white amorphous salt, difficulty soluble in water, readily soluble in alcohol.

Scandium Iso-butyrate $(CH_3.CH_3.CH.COO)_2ScOH.2H_2O$. More soluble in cold than in hot water; very soluble in alcohol, and precipitated by water from the alcoholic solution.

Scandium Isovalerate, $(C_4H_9COO)_2ScOH.2H_2O$. A white amorphous salt, soluble in cold water, precipitated on boiling, and again dissolved on cooling.

Scandium Oxalate, $Sc_2(C_2O_4)_3.5H_2O$. A white crystalline powder, slightly soluble in water, in weak acids, and more so in solution of ammonium oxalate.

Scandium Picrate, $[C_6H_2(NO_2)_3O]_2ScOH.14H_2O$. Forms groups of long needle-shaped crystals of a rich yellow color, or confused feathery masses. Water dissolves less than 1 per cent. at 20° C.

Scandium Benzoate, $(C_6H_5COO)_3Sc$. White crystalline powder, slightly soluble in water and in alcohol, but easily soluble in dilute mineral acids.

Other salts described are the ortho-toluate, meta-toluate, para-toluate, phenyl-acetate, pyromellitate, and camphorate.—Chem. News, Dec. 4, 11, 18 and 24, 1908, 274–277, 283–285, 295–297, and 307–309.

Ytterbium—Separation into Two New Elements.—A. v. Welsbach has separated ytterbium into two distinct new elements, one of which he has named "aldebarium" (*A*, = 172.9), the other "cassiopoeium" (Cp, = 174.23). Each of these elements forms a sesquioxide, and both form colorless salts.—Pharm. Journ., Oct. 10, 1908, 464; from Liebig's Annalen, 1908, 190.

Cerium — Determination in Minerals.—M. Dittrich recommends a method for the determination of cerium and other rare earths in rocks, which is dependent on the following observations: When oxalic acid or ammonium oxalate is added to a solution of a cerous salt, cerous oxalate is precipitated quantitatively. If a solution of a ferrous salt is added to that of the cerium salt a precipitate is still formed, but it contains iron. When some Cc. of a neutral ferric salt are present no precipitate is obtained with ammonium oxalate or oxalic acid until they have been added in excess, when the red color of the ferric salt is changed to the green of the complex ferric oxalate, and further addition of oxalate gives a pure white precipitate of cerous oxalate. Conversely, the oxalate precipitate is dissolved when a solution of an iron salt is added to it. Evidently the stronger ferric ions withdraw the oxalate residue from the cerous oxalate precipitate, forming complex ferric oxalate ions, and no precipitate can be formed until all the iron has been converted into the complex state. To

separate the cerium quantitatively a very large excess must be used, 200 Cc. of a saturated solution of ammonium oxalate for 0.2 Gm. of cerous sulphate, and 15 Cc. of concentrated ferric salt solution. It is better to use ammonium oxalate rather than oxalic acid, and to precipitate a hot solution. A dilute ammonium oxalate solution must be used for washing. In dealing with rocks it is best to remove silica by means of hydrofluoric acid and sulphuric acid, and to dissolve the residue in a little hydrochloric or nitric acid. On the addition of oxalate all the calcium is precipitated, and must be removed by igniting the precipitate obtained by adding ammonia to the residue after it has been dissolved in acid.—Chem. News, Feb. 19, 1909, 96; from Ber. d. D. Chem. Ges., *41* (1908), No. 18.

Cerium Sulphides—Preparation.—According to Wilhelm Biltz, cerium sesquisulphide can readily be obtained by sulphating cerium dioxide with hydrogen sulphide at a bright red heat, or by heating cerous sulphate in a current of hydrogen sulphide. At a lower temperature the disulphide is formed.

Cerium Sesquisulphide, Ce_2S_3, is a dark brown, crystalline powder which is stable in air and water, and, while melting between 1400° and 1500° C. with decomposition, is stable in an atmosphere of hydrogen at a red heat. It dissolves in dilute acetic acid in the cold, and also in dilute hydrochloric and sulphuric acids.

Cerium Disulphide does not appear to be a derivative of tetravalent cerium corresponding to the dioxide, but it is rather to be regarded as a polysulphide of formula Ce_2S_3S. It decomposes at 720° C.—Chem. News, Dec. 4, 1908, 280; from Ber. d. D. Chem. Ges., *41* (1908), No. 14.

Thallium—Toxicity.—D. Olmer and A. Tian call attention to a recent case in which severe toxic symptoms followed the application of thallium acetate as a depilatory to the chest. Intense pain in the extremities increased on pressure over the nerves, followed with sudden and complete alopecia, even the eyebrows and eyelashes falling off; persistent albuminuria, stomatitis and general depression, accompanied by an accelerated pulse, resulted. In a month these symptoms gradually diminished, the hair began to grow again and convalescence commenced. Twenty-five days after the application the patient's cephalo-rachidian fluid gave spectroscopic evidence of the presence of thallium. Thallium acetate has been found by Combemale to act as an anhydrotic in the treatment of the nocturnal sweats of phthisis, but Huchard in 1908, while confirming this, showed that the salt occasioned a rapid loss of hair. This precludes thallium acetate from use for medicinal purposes.—Pharm. Journ., April 3, 1909, 463; from L'Union Pharm., *50* (1909), 53.

CHROMIUM.

Chromium—Detection.—E. Pozzi-Escot has shown in a previous paper

with what facility sodium hypobromite transforms chromium oxide into chromate. The method appears to be an excellent one for the detection of very small quantities of chromium in the presence of thousands of times its weight of iron, manganese, cobalt, nickel, copper, etc., alone or in mixture. For this purpose a solution of sodium hypobromite containing a large excess of sodium hydroxide is poured into a boiling solution of the salts to be tested; the boiling is maintained for a few minutes, then the source of heat removed, and in about five minutes the liquid is filtered. The chromium is found entirely in the form of chromate in the filtered alkaline solution, from which it may be precipitated by lead acetate.—Pharm. Journ., Oct. 17, 1908, 490; from Ann. de Chim. Analyt., Sept. 15, 1908, 333.

Perchromates—Classification.—According to the investigations of E. H. Riesenfeld, the higher oxidation products of chromium can be divided into two classes: (1) Chromium textroxide derivatives; (2) The perchromates proper, which include the salts of perchromic acid $HCrO_5$ (chromium pentaperacid), "blue perchromates," and the salts of perchromic acid H_3CrO_8 (chromium octoperacid), "red perchromates." The determination of the molecular weight of red potassium and ammonium perchromates shows that they are monomolecular, and probably the free acid also has the simple molecular weigh'. By determining the electro-chemical equivalent of chromium in the red perchromates, it was shown that the chromium was not hexavalent, and an argument against the hexavalency of chromium in the perchromates is provided by the fact that as long as potassium is taken to be mono- and oxygen divalent constitutional formulæ of the perchromates can only be constructed on the assumption that chromium has an odd valency. The comparison of the peroxide of chromium with those of the other elements shows that the oxygen is not electro-chemically monovalent; chromium peroxide is an antozonide like the peroxides of the alkalies and alkaline earths. From experiments on the action of perchromate on permanganate it appears that both in the red and blue perchromates chromium is heptavalent.—Chem. News, Jan. 8, 1909, 24; from Ber. d. D. Chem. Ges., *41* (1908), No. 16.

MANGANESE.

Manganese—Detection of Traces.—M. Duyk finds the following tests available for the detection and determination of traces of manganese: On boiling a moderately alkaline solution of hypochlorite (of 10 per cent. strength), to which a trace of manganese salt has been added, and then a drop of a 10 per cent. solution of copper sulphate, there is produced first a precipitate of cupric oxide. After heating for a short time the manganese communicates to the supernatant liquid a magnificent violet tint, which is attributed to the formation of potassium permanganate. The reaction

is certain whatever the quantity present, and is extremely delicate. A fraction of a milligram of manganese may be detected in this way; a quarter of a milligram of the metal communicates a perceptible tint to 4 or 5 Cc. of the solution of potassium hypochlorite. The scale of colors thus produced is very regular and may be used as a colorometric process. Solutions of calcium and sodium hypochlorite act in the same way, provided they are of the same strength as that of the potassium salt and do not contain excess of alkali. The reaction is impaired by too great dilution of the liquors, by acidity or too much alkalinity, and also by reducing agents. The method is specially applicable to the detection and determination of manganese contained in plant ashes, manganiferous wines, etc. —Pharm. Journ., July 25, 1908, 82; from Rev. Pharm., 1908, 143.

Potassium Permanganate—Stability of its Volumetric Solutions.—Bernard Collit observes, that it is generally supposed that standard volumetric solutions of potassium permanganate are very unstable and soon lose strength—an idea which is strengthened by statements occurring in many text-books on analytical chemistry. Having some time ago come across a small American book entitled "Methods of Chemical Analysis and Foundry Chemistry," by Frank L. Crobaugh, his attention was attracted to a statement that a standard solution of permanganate had retained its titer (39.7 Cc. on 1.4 Gm. ammonia-ferrous sulphate) unchanged during a period of four months, when it was practically consumed, he tested the statement practically, and confirmed it absolutely, a decinormal solution of permanganate, standardized on iron wire, or ammonia-ferrous sulphate, and on oxalic acid retaining its titer unchanged during the entire period of the experiment, which extended over one year.—Pharm. Journ., Dec. 5, 1908, 724.

Zinc Permanganate—Preparation.—Dr. Gunnar Heikel prepares zinc permanganate from potassium permanganate by the intermediation of the silver salt, decomposing this with zinc chloride. To a saturated solution of potassium permanganate the equivalent quantity of a concentrated solution of silver nitrate is added, the mixture being kept cold by ice and left standing for several hours so as to effect the precipitation, as complete as possible, of the sparingly soluble silver permanganate. This is collected and washed with cold water—preferably using a suction pump and berliner funnel—until free from potassium nitrate. The pure silver salt is then dried below 100° C., the yield being about 80 per cent. of the theoretical quantity, while the rest of the silver may be recovered from the washings by precipitation with sodium chloride. The dry silver permanganate, accurately weighed, is transferred to an evaporating dish, 5 to 8 times its weight of water is added, and the mixture heated on a steam-bath with the exactly equivalent quantity of pure zinc chloride, with frequent stirring, for a couple of hours. If the right amount of zinc chloride was added, neither silver or chlorides will be found in the filtrate, which has

been obtained by decolorizing a few Cc. of the liquid by heating with nitric acid and formaldehyde. Otherwise more zinc chloride or silver permanganate, as may be determined by the test, must be added before filtration from the silver chloride formed by the reaction. The yield of $Zn(MnO_4)_2.6H_2O$, on evaporating the filtrate to dryness on a steam-bath, is somewhat more than the $KMnO_4$ originally taken. Obviously the silver employed in this process may all be collected as chloride and reduced to the metallic state by means of zinc in a hydrochloric acid solution. In the author's experience, this is quantitative.—Amer. Journ. Pharm., Dec., 1908, 586–587.

IRON.

Pure Iron—Physical Properties.—Kreuser has made a study of the physical properties of *pure* iron, his material containing only extremely small traces of sulphur, and about $\frac{1}{1000}$ per cent. each of manganese, copper and nickel. This extremely pure iron resembled platinum in appearance, acquired a high polish, and on erosion developed large crystals. The metal was very malleable and ductile. Hydrochloric acid was without effect upon it, even by boiling, but nitric acid readily dissolved the iron.—Pharm. Ztg., liii (1908), No. 89, 880; from Verh. d. D. phys. Ges., 1908, 344.

Ferrous Solutions—Resistance to Atmospheric Oxidation.—T. Warynski has made a number of experiments to determine how far ferrous solutions are liable to oxidation by air. Solutions of pure ferrous sulphate, rendered feebly acid by sulphuric acid, were placed in large stoppered flasks which were opened from time to time to permit of the absorption of oxygen, the flasks containing variable quantities of the solutions in order to study the influence of surface exposed. At frequent intervals, the solutions were titrated by means of verified permanganate solutions, when oxidation was found to have taken place only to a very small extent—from 1.0 to 1.4 per cent. in four months. Under the influence of heat, the ferrous solutions appear to be equally resistant to atmospheric oxidation. The presence of excess of sulphuric acid seems to retard oxidation perceptibly. The presence of foreign bodies, however, even in traces, distinctly hastens the process of oxidation. In the case of copper salts as impurity the catalytic action is especially marked, and this when only feeble traces are present, and so also with platinum chloride and palladium nitrate. Hydrochloric acid in strong concentration renders the solution more liable to oxidation.—Pharm. Journ., March 20, 1909, 394; from Ann. de Chim. Analyt., Feb. 15, 1909, 45.

NICKEL.

Nickel—Formation of Compound (NiSb) with Antimony.—Em. Vigouroux finds that the action of vapors of antimony trichloride on powdered nickel at 600° C. leads to the formation of a compound of the formula

NiSb. This forms a metallic crystalline powder, of a reddish-violet color, and is non-magnetic. It fuses when heated to 1100° C., and begins to decompose at 1400° C., giving up antimony. Chlorine and oxygen attack it at a red heat, while sulphur decomposes it before the melting point is reached. Hydrochloric acid has no effect upon it, even when concentrated, nor has diluted sulphuric acid; but concentrated sulphuric acid, and also concentrated nitric acid, act rapidly on it, especially when the temperature is raised. Fusion with alkalies seems to have very little effect. —Chem. News, Jan. 8, 1909, *22*; from Compt. rend., *147* (1908), No. 21.

Nickel—Absorption of Hydrogen.—According to the experiments of Sieverts and Beckmann, 1 vol. of nickel absorbs from 0.25 to 0.5 vol. of hydrogen between 277° and 580° C., while Mayer and Altmayer have recently stated that much larger quantites of hydrogen are absorbed. A. Sieverts and J. Hagenacker have now performed many experiments with nickel at various temperatures, and have confirmed the former experimenters' results. They have also determined the influence of pressure on the absorption of hydrogen by nickel. At 822° and 923° C. the absorption is not proportional to the pressure, but is very nearly proportional to the square root of the pressure.—Chem. News, Mar. 12, 1909, 132: from Ber. d. D. Chem. Ges., *42* (1909), No. 2.

Nickel—Harmlessness in Culinary Utensils.—Since nickel or nickel-plated vessels are coming into use as culinary utensils, W. S. and S. K. Dzerchgouski and N. O. Schoumoff Sieber have made experiments to determine the solubility of the metal in such fluids as it is likely to come in contact with in the kitchen, and the action of doses of organic nickel compounds on the organism equivalent to, or greater than, the amount so dissolved. The results show that nickel is quite inoffensive when used for this purpose. In such doses, administered for a long period, it is free from any toxic action. Food boiled in nickel vessels was found, under varying conditions, to contain from 0.02 to 2 per cent. of the metal, the quantity varying with the amount of acid in the material used. A solution containing 4 per cent. of acetic acid and 5 per cent. of common salt was boiled for three hours in a nickel vessel, then allowed to stand for a further eleven hours. It then contained 0.144 per cent. of nickel. Fifty and 100 Mgm. of nickel in the form of lactate or butyrate was given daily to two dogs for seven months. Neither showed any ill effects. When killed no alteration of any of the organs could be discovered, nor was any trace of nickel found in the organism. Larger doses, up to 0.25 Gm., of nickel for 202 days were also without result. One dog, which had taken 9.7 Gm. of nickel in forty-two days, died; but its death could not be attributed to the nickel, for none could be detected in the body. It required doses of 1 to 2 Gm. of nickel *per diem* to cause symptoms of poisoning. It is thus shown that, even when taken for a long period in

much larger doses than can be derived from nickel cooking vessels, the metal is quite devoid of harmful effects.—Pharm. Journ., Jan. 2, 1908, 6; from Arch. biolog., St. Petersburg, through Nouv. Remèdes, *25* (1908), 485.

COBALT.

Cobalt—Formation of Alloys with Antimony.—According to F. Ducelliez powdered cobalt decomposes antimony trichloride at 700° C., and at 800° C. the compound CoSb being formed. The alloys of cobalt and antimony can be divided into three classes: 1. Those containing less than 67.04 per cent. of antimony. These give crystals of CoSb when treated with hydrochloric or sulphuric acid. 2. Those containing 67.04 to 80.27 per cent. of antimony. These are readily decomposed on heating, and give the compound CoSb when kept at 1200° C. in a current of hydrogen. 3. Those containing more than 80.27 per cent. of antimony. These yield the antimonide, $CoSb_2$, when treated with nitric and hydrochloric acids. The two substances CoSb and $CoSb_2$ are the only compounds which exist among the alloys of cobalt and antimony. Chemical reagents have similar effects on the two compounds, *e. g.*, when heated in chlorine heat is disengaged and antimony chloride distils. With oxygen incandescence is observed, and antimony oxide is formed. Sulphur attacks them violently. Dilute or concentrated nitric acid dissolves the cobalt, and leaves a deposit of antimonic anhydride. Aqua regia entirely dissolves them, but alkalies and alkaline carbonate when fused with them attack them only with difficulty. —Chem. News, Jan. 8, 1909, 23; from Compt. rend., *147* (1908), No. 22.

TUNGSTEN.

Tungstic Anhydride—New Method of Separation from Silica.—Ed. Defacqz describes a new method of separating silica and tungstic anhydride, as follows: The mixture of silica and tungstic anhydride is heated to a red heat in a current of hydrogen. Between 600° and 900° C. silica is not reduced by hydrogen, nor has chlorine any action upon it, while at the same temperature hydrogen reduces tungstic anhydride to lower oxides, or even metal, and chlorine readily yields hexachloride or oxychloride. When the action is over the substance is heated in a glass tube to a red heat in a current of dry chlorine, and the volatile products are condensed. All the tungstic anhydride then volatilizes either as hexachloride or oxytetrachloride. This is dissolved in aqueous ammonia, and the tungsten is determined in the solution in the usual way. The residue of silica is weighed after the chlorine has been expelled by heating in air or hydrogen. This method of separation can be applied to any mixture of compounds containing oxygen, if one of the compounds can be reduced by hydrogen, and the resulting substance yields a volatile chloride. Chem. News, July 24, 1908, 47; from Compt. rend., *146*, (1908), No. 25.

Borotungstic Acids—Formation and Composition.—H. Copaux has isolated and describes two borotungstic acids. When one part of neutral sodium tungstate and one and a half parts of boric acid are treated with boiling water, a mixture of sodium metatungstate and borotungstate is formed and, on standing, a crystalline mass of boric acid and sodium polyborates separates, while from the filtrate, after concentration, the two borotungstic acids may be isolated. One crystallizes in the hexagonal system, and has the formula $B_2O_3.28WO_3.62H_2O$; the other forms quadratic crystals, and its formula is $B_2O_3.24WO_3.66H_2O$.—Chem. News, Jan. 8, 1909, 22; from Compt. rend., *147* (1908), No. 21.

MOLYBDENUM.

New Element Allied to Molybdenum—Preliminary Note.—In the course of an examination of molybdenite in connection with his work on *Hipponium* (which see), Mesataka Ogawa obtained a substance which was supposed to be ammonium vanadate and set aside as such. A further examination of this substance has shown, however, that it is not ammonium vanadate, but that it is a compound of a new element closely allied to molybdenum, and indeed, associated with it in this compound. The results so far obtained, which are described in the present paper, being still very incomplete, the present communication, while interesting, must be regarded as a preliminary note.—Chem. News, Nov. 27, 1908, 261–264.

URANIUM.

"A Piece of Pitchblende"—Review of its Scientific Importance.—In a post-graduate lecture given under the auspices of the Philadelphia Branch of the A. Ph. A., Harry F. Keller gives an interesting and entertaining account of the remarkable scientific investigation and observations that have followed the brilliant researches of Ernest Rutherford, whereby modernly the existence of the wonderful substance, radium, was demonstrated in "bitchblende," or uranite, a mineral occurring in Joachimsthal, Bohemia, and known since 1789 as the source of the metal uranium, which was discovered as its principal constituent by a German apothecary, Martin Henry Klaprott. This lecture is published complete, with a number of illustrations, in the Amer. Journ. Pharm., April, 1909, 157–174.

Uranium and Cadmium—New Reaction and Method of Distinction.—Lemaire, employing a reagent composed of a 5 per cent. solution of thiosinamine, to which 5 per cent. of commercial potassium hydroxide solution is added immediately before use, has determined a characteristic test for the presence of uranium and cadmium salts; a permanent yellow precipitate being produced if 2–3 drops of a solution containing either of these salts are added to 3–4 Cc. of the reagent and heated to boiling. The two metals are easily distinguished from each other, since hydrogen sulphide precipitates only the cadmium from a hydrochloric acid solution,

and ammonium sulphide only the uranium.—Pharm. Ztg., liii (1908), No. 89, 880; from Rép. de. Pharm., 1908, No. 10.

Uranyl Chloride, UO_2Cl_2—Reduction and Dissociation.—According to Oechsner de Coninck, uranyl chloride is readily reduced at an incipient red heat by hydrogen according to the following equation; $UO_2Cl_2 + 2H = UO_2 + 2HCl$. This process the author has applied to determine the atomic weight of chlorine, but the results obtained did not agree very well; the mean value was 35.36. Uranyl chloride, moreover, has a tendency to dissociate into chlorine and a subchloride, and it reacts very readily with the water vapor of the air, giving hydrochloric acid and uranium trioxide, $UO_2Cl_2 + H_2O = UO_3 + 2HCl$.—Chem. News, Febr. 5, 1909, 71; from Compt. rend., *147* (1908), No. 26.

Uranium Disilicide, Si_2U—Preparation and Properties.—Ed. Defrasqz finds that the aluminothermic method which has been applied to the preparation of silicides of tungsten and molybdenum from their oxides may also be used for the preparation of uranium disilicide, Si_2U. This is a gray metallic powder of density 8 at 0° C. Chlorine decomposes it at 500° C., giving the corresponding chlorides. It is soluble in hydrofluoric acid, insoluble in nitric acid, hydrochloric acid, sulphuric acid and aqua regia. It is not readily oxidized, and is unaltered in air even at a red heat. Mixtures of alkaline nitrate and carbonate attack it only slightly at their melting point, but at a red heat fused alkalies and alkaline carbonates convert it into alkaline silicate and uranate. Potassium bisulphate acts on it slowly at temperatures above its melting-point.—Chem. News, Jan. 8, 1909, 23; from Compt. rend., *147* (1908), No. 22.

RADIUM.

Radium Emanation—Influence on the Rate of Crystallization.—Louis Frischauer finds that when sulphur is allowed to crystallize, being meanwhile exposed to the action of radium, it is found that the number of centers of crystallization is greatly increased, rising to double that in specimens of sulphur which were treated in exactly the same way but were screened from the effect of the radium rays by means of lead foil. Moreover, the propagation of the crystallization from drop to drop is more rapid. When crystallizing sulphur is exposed to radium emanation it is found that the acceleration is caused by the induced activity rather than by the α rays of the emanation. Probably the γ-rays of radium have no action upon the crystalline transformation, the effects being due only to the β-rays.—Chem. News, June 18, 1909, 299; from Compt. rend., *148* (1909), No. 19.

Radium Chloride—Industrial Preparation.—According to H. Paweck, radium chloride is prepared at the recently erected works at Joachimsthal, by the following method: The uranium ore is first picked by hand, ground

to a fine powder, and roasted with 15 per cent. of sodium carbonate and 2 per cent. of sodium nitrate. The product is ground and washed in water, then treated with concentrated sulphuric acid and a little nitric acid, washed out with water, and the solution containing uranyl sulphate worked up for uranium pigments, whilst the residue forms the starting point for the preparation of radium. This is dried in the air, digested with dilute caustic soda, the residue washed and treated with dilute hydrochloric acid (the liquid contains most of the polonium and actinium), then washed with water and boiled with sodium carbonate solution for ten hours. In this way the greater part of the impurities (iron, aluminum, calcium, silicon, lead, etc.), is removed, and the sulphates of radium and barium converted into the carbonates. The residue is washed free from sodium sulphate and digested with pure dilute hydrochloric acid. The filtrate contains part of the radium, and the residue is twice subjected to the above treatment with sodium carbonate, washing, and digestion with hydrochloric acid, whereby two more filtrates containing radium are obtained. The three filtrates are united and filtered from the lead chloride which separates out on standing. The liquid is now treated with dilute sulphuric acid, the precipitated crude sulphate boiled with concentrated sodium carbonate solution, and the residue of carbonates and undecomposed sulphates washed and added to pure dilute hydrochloric acid. The liquid, after removal of lead by means of hydrogen sulphide, is evaporated to dryness and digested with concentrated hydrochloric acid, which dissolves calcium and strontium chlorides, and leaves a residue of barium and radium chlorides. A further quantity of crude chloride is obtained from the undecomposed sulphate by removing lead chloride with hot water, and converting the sulphate into chloride by the above process. The crude radium chloride is now freed from barium chloride by fractional crystallization, the latter being the more soluble.—Pharm. Journ., Oct. 31, 1908, 550; from Zeit. Electrochem., *14* (1908), 619–623.

TIN.

Tin—Information on which Text-Books are Usually Deficient.—D. B. Dott observes that the ordinary text-books are deficient in information or misleading regarding the properties of tin or its compounds. Hydrated stannic acid, for example, is not necessarily insoluble in acids. The moist oxide, H_2SnO_3 (metastannic acid), dissolves in hydrochloric acid, and it does so even after drying some hours on a water-bath, becoming insoluble only after complete conversion (by ignition) into SnO_2. Stannic chloride, which is stated to boil at 120° C., is easily lost even by the most gentle evaporation. Low, in his "Manual of Assaying," recommends treatment of ores containing tin as sulphide, also ores containing copper, with aqua regia, evaporating, washing, and drying, previous to fusion with soda, for the volumetric estimation of the tin. It is certain that this treatment re-

sults in more or less complete loss. The proper treatment consists in warming with strong nitric acid, so as to convert the tin into metastannic acid, which when washed and dried is ready for fusion and volumetric determination.—Pharm. Journ., Oct. 17, 1908, 486.

Stannic Oxide—Method of Reduction.—D. B. Dott proposes a method for the reduction of stannic oxide, which has the distinct advantage over the ordinary method employed in that it is not necessary to resort to fusion and that the method is equally applicable in the presence of silica, for which the older method is almost inapplicable. When stannic oxide, whether natural (cassiterite) or artificial, is treated with boiling hypophosphorous acid (30 per cent.), or with a mixture of that acid and hydrochloric acid, the oxide remains in its insoluble form; but when the oxide is heated with the acid to a temperature under redness it becomes reduced to the stannous state, as phosphate or pyrophosphate. The resulting mass dissolves almost completely in hydrochloric acid, and the solution may be further treated in the ordinary way of analysis. In the presence of silica, the gently ignited mass, when treated with HCl and water, filters readily and leaves the silica on the filter.—Pharm. Journ., Nov. 7, 1908, 535.

LEAD.

Litharge—Commercial Quality.—With the object of collecting data for the revision of the B. P., E. F. Harrison and H. E. Watt have subjected seven samples of litharge, such as is ordinarily supplied for pharmaceutical use, to the tests of the Pharmacopœia. With one exception the samples left only traces or nothing undissolved in boiling nitric acid, the exception leaving about 1 per cent. In boiling acetic acid three samples showed a residue (peroxide) of 0.94, 1.78 and 2.04 per cent. of residue, two appreciable traces, the others inappreciable traces. Iron was present in traces in all. Copper in none. Arsenic was not found in appreciable quantity in any. The loss on ignition (water and CO_2), varied from 1.43 to 2.52 per cent. —Trans. Brit. Conf. (Yearbook of Pharmacy) 1908, 527–528.

Red Lead—Adulteration with Dyed Barium Sulphate.—D. B. Dott calls attention to a novel adulteration of red lead which he had occasion to examine because of its failure to form a proper glaze on tiles. The adulterant consisted to the amount of 50 per cent, of crude barium sulphate, colored with aniline red to imitate the natural color of the red lead.—Pharm. Journ., Dec. 19, 1908, 802.

TITANIUM.

Titanium Nitride—Compounds with Halogens.—Otto Ruff and Fritz Eisner find that the titanium nitride to which Wöhler, Friedel and Guêrin ascribed the formula Ti_3N_4, and Schneiden "Nitride A," consist of the nitride of trivalent titanium, TiN, containing titanium-nitrogen chloride

and titanium dioxide as impurities; when it is heated for some time to a high temperature in a current of ammonia, the chlorine and oxygen are completely removed and the pure nitride, TiN, is left behind. When liquid ammonia is added to titanium tetra-chloride or tetrabromide and the product is washed with liquid ammonia, compounds are formed which contain at least one atom of halogen, or the corresponding amount of oxygen to one atom of titanium. They are transformed into the titanium-nitrogen haloids, TiNCl and TiNBr, on heating, and on being more strongly heated they yield titanium nitride, titanium chloride, or bromide and nitrogen. They are exceedingly sensitive towards moisture. The fact that the halogen is more strongly bound to titanium than to silicon (the tetrachloride of which is completely decomposed by ammonia) shows the more strongly positive character of titanium. It is noteworthy that titanium readily passes from the tetra to the trivalent state at a high temperature if it is combined with the less negative nitrogen instead of with chlorine or bromine.—Chem. News, Oct. 9, 1908, 186; from Ber. d. D. Chem. Ges., *41* (1908), No. 11.

New Titanium Iodide—Preparation.—Ed. Defasqz and H. Copaux prepare a new titanium iodide as follows: Two boats, one of which contains the tetraiodide and the other mercury, are heated side by side in a porcelain tube through which a current of dry hydrogen is passed. Thus a sublimate is formed which consists of crystals of the di-iodide. This substance is black and shining, infusible, not volatile, and very hygroscopic. It is not reduced by hydrogen at a dark red heat, but yields amorphous titanium at a white heat. The chloride is obtained when it is gently heated in a current of chlorine. Oxygen decomposes it into iodine and titanic acid. Sulphur and phosphorus react upon it at their melting-points, giving the corresponding compounds. Nitric and sulphuric acids attack it violently in the cold, setting free iodine. Gaseous ammonia gives an addition product.—Chem. News, Aug. 14, 1908, 83: from Compt. rend., *147* (1908), No. 1.

THORIUM.

Nipponium—A New Element in Thorianite.—While working on thorianite in University College, London, under Sir William Ramsay's direction a few years ago, Masataka Ogawa met in the iron group, in the usual course of analysis, with an element believed to be new, but, owing to the small quantity, its nature could not be fully established. Since then the author has found the same element to occur in other minerals, such as reinite and molybdenite, and in the course of further experiments, given in detail, he has demonstrated that the substance is in fact a new element, for which he proposes the name "Nipponium," with the symbol Np, as once suggested by Sir William Ramsay. The hydroxide of this new element, when recently precipitated by ammonia in the presence of an excess

of ammonium chloride, is almost white, with a pale yellow tinge, but on drying it becomes very nearly black. A solution of the hydroxide in hydrochloric acid has a yellowish-green color. The equivalent weight of it is about 50; this element probably filling the gap between molybdenum and ruthenium and having an atomic weight of about 100. The chloride gives a characteristic line, besides two other feebler lines, in the green-blue part of the spectrum, having a wave length of 4882.—Chem. News, Nov. 20, 1908, 251.

Thorium Chloride—Preparation.—Camille Matignon does not recommend the method of preparing thorium chloride by $COCl_2$, as below described by Chauvenet. He finds that the action of chlorine and sulphur chloride provides a general method of chlorinating metallic oxygen compounds, and by means of it thorium oxide can rapidly be converted into the chloride in glass tubes at a temperature below the melting point of glass. The hygroscopicity of the chloride is apparently due to the presence of impurities, and the pure chloride absorbs moisture only very slowly. The author obtained a value for the heat of solution of the chloride in water, which is considerably lower than that found by Chauvenet.—Ibid., Jan. 15, 1909, 35; from Compt. rend., *147* (1908), No. 24.

Thorium Chlorides and Oxychlorides—Formation and Composition.—According to Ed. Chauvenet, the anhydrous chloride of thorium, $ThCl_4$, can be prepared conveniently by the action of phosgene gas on the oxide at a red heat. $ThO_2 + 2COCl_2 = 2CO_2 + ThCl_4$. The current of gas must be very slow so that the anhydrous chloride may sublime by degrees in the front of the tube in which the oxide is heated. The author finds that though this compound has been described as not deliquescent it combines fairly rapidly with the water vapor of the atmosphere. When an aqueous solution of the anhydrous chloride is evaporated on the water-bath and then in a dry atmosphere to constant weight, the hydrated chloride, $ThCl_4.7H_2O$, is obtained. Heating to 120–160° C., again to constant weight, gives the oxychloride, $Th(OH)Cl_3.H_2O$. At about 200° C., $ThCl_4.7H_2O$ is transformed into a compound intermediate between $ThOCl_2$ and $ThOHCl_3$, and at 250° C. in a current of hydrogen chloride gas the hydrated chloride loses half its chlorine and gives the anhydrous compound $ThOCl_2$.—Chem. News, Jan. 8, 1909, 23; from Compt. rend., *147* (1908), No. 22.

BISMUTH.

Bismuthi Hydroxidum is the subject of a paper, involving much study, by Otto Raubenheimer, which is printed in the "Proceedings" of this Association, 1908, 1010–1015.

Bismuth—Neutral Salts.—Vanino and Zumbusch communicate the results of experiments undertaken to obtain neutral bismuth salts (carbonates and oxalates), employing for this purpose concentrated solutions

of bismuth nitrate obtained by triturating molecular quantities of the nitrate and mannite with water. The production of a

Neutral Bismuth Carbonate was not successful, the compound $(BiO)_2CO_3$, being generally produced. On the other hand, the authors succeeded in preparing a

Neutral Bismuth Oxalate.—The salts are very sensitive to the action of water, neutral oxalate of uniform composition being attainable only by careful observance of identical conditions of washing and precipitation, as well as by close adherence to the proper temperature.—Pharm. Ztg., liv (1909), No. 4, 38; from Ber. d. D. Chem. Ges., xli (1908), 3994.

Bismuth Salts—Determination of Nitrate Present.—W. H. Simmons observes that the most convenient method for estimation of nitrate in bismuth oxide, hydrate, citrate, carbonate, oxychloride or phenate is undoubtedly the indigo process. This is carried out by preparing a standard solution of indigo carmine, made by dissolving 5 Gm. of indigo carmine in water, filtering, adding 50 Cc. of concentrated sulphuric acid, and diluting to 1 liter. This solution is then standardized by taking measured volumes of a 0.1 per cent. solution of KNO_3, diluting to 25 Cc. with distilled water, quickly adding 25 Cc. of concentrated sulphuric acid, and running in the indigo solution until a permanent bluish green tint is produced. From the results so obtained a curve may be plotted with the proportion of N_2O_3, or, if preferred, the equivalent of bismuth nitrate or subnitrate as ordinates and the number of Cc. of indigo required as abscissæ.

Unfortunately this process does not work satisfactorily in the case of bismuth salicylate, tannate or gallate, and no process has yet been devised for the two latter salts. With the salicylate, however, after trying several processes, a modification of Looff's method, which depends on the formation of nitrosalicylate, was adopted. For this from 0.2 to 0.5 Gm. of the bismuth salicylate is weighed out into a wide boiling tube about 3 Cm. in diameter, shaken with 5 Cc. of water, and 10 Cc. of concentrated sulphuric acid cautiously added by pouring down the side of the tube, after which the whole is gently mixed. A reddish-brown to crimson color is produced if nitrate be present, and this color is matched by taking measured volumes of the 0.1 per cent. KNO_3 solution in similar tubes, diluting with water to 5 Cc., adding about 0.1 Gm. of sodium salicylate, then 10 Cc. of concentrated sulphuric acid, as in the actual test. The diameter of the tubes appears to have a good deal of influence on the color, and as the latter is fugitive the sample and standards must be prepared and examined at the same time.—Chem. and Drugg., Aug. 1, 1908, 198.

COPPER.

Copper—Determination in Preserves.—H. Zanagisawa recommends

cadmium as a precipitant for determining the presence of copper in preserves. The dried substance is incinerated in a porcelain capsule, and the ash dissolved in warm hydrochloric acid. The solution is supersaturated with ammonia, filtered into a weighed platinum dish, a small piece of metallic cadmium added, and the whole warmed gently on the water-bath. In about fifteen minutes, the copper is completely thrown down as a bright red, glistening coating on the bottom of the dish. After thorough washing and drying, it is weighed. The method is said to give good results.—Apoth. Ztg., xxiii (1908), No. 101, 913; from Journ. der Pharm. Gess. v. Japan, 1908, 1013.

Cuprous Sulphate—Preparation and Properties—Although many attempts have been made to isolate cuprous sulphate in the solid state, they have heretofore not succeeded. A. Recoura has now, however, obtained this salt by the double decomposition of cuprous oxide and methyl sulphate in an atmosphere devoid of oxygen. The resulting salt, Cu_2SO_4, is a grayish-white powder, quite stable in dry air. It is decomposed into cupric sulphate and metallic copper on contact with water. It is readily soluble in strong hydrochloric acid and in ammonia, and is partially dissolved by glacial acetic acid, with which it forms an intensely deep violet solution; which becomes blue on exposure to air, oxidizing and depositing crystals of acid cupric acetate. Ethyl sulphate may be used instead of methyl sulphate for its preparation, but is less satisfactory, since the completion of reaction is less evident.—Pharm. Journ., June 26, 1909, 862; from Compt. rend., *148* (1909), 1106.

MERCURY.

Mercuric Oxide—Acidimetric Estimation.—Rupp and Schirmer in view of the impracticability of a direct acidimetric method for the estimation of mercuric oxide—solution of the oxide in normal acid and titration of the excess of acid with normal alkali—have devised an indirect method, which is well adapted for its estimation in neutral pharmaceutical preparations which are not affected by alkalies. The method is based on the reaction between mercuric oxide and potassium iodide, and the subsequent titration of the liberated alkali, which results in conformity with the following equation:

$$Hg<\begin{matrix}OH\\OH\end{matrix}+4KI=K_2HgI_4+2KOH.$$

The method is carried out as follows: A suitable quantity of the preparation under examination, corresponding to 0.05–0.5 Gm. HgO, is shaken frequently during 10–15 minutes with a solution of 2 or 3 Gm. of potassium iodide in 10–20 Cc. of water, at the temperature of the room or of a water-bath. When it becomes apparent that the oxide is completely dissolved, 2 drops of 0.2 per cent. solution of methyl orange are

added, and the solution is titrated with $\frac{N}{10}$ hydrochloric acid until its yellow color changes to red, each cubic centimeter of $\frac{N}{10}$ HCl corresponding to 0.01 Hg or 0.0108 HgO. The method is well adapted for the determination of the mercury content in mercuric oxide ointments.—Pharm. Ztg., liii (1908), No. 94, 928.

Yellow Mercuric Oxide—Filter Fibers in the Commercial Product.—A. Nygard states that commercial yellow oxide of mercury frequently contains fibers of filter-paper derived from the paper on which the precipitate is collected or dried. This foreign matter is readily seen when the oxide is dissolved in nitric acid. The occurrence of this impurity, which is to be avoided in an article intended for ophthalmic use, may obviously be prevented by washing the precipitate by decantation, then drying in a thin layer on a flat glass or in a porcelain capsule, keeping it covered with paper and protecting it from light. The precipitate is best produced by means of sodium hydroxide, not potassium hydroxide, as prescribed by the German Pharmacopœia, because it may then be washed with cold water. It should never be collected in paper or woven fabrics, so that the introduction of fibers may be avoided.—Apoth. Ztg., xxiii (1908), No. 96, 874; from Farm. Notisblad, 1908, No. 18, 256–257.

Mercuric Iodide—Determination in Liquid Paraffin Solutions.—Drs. Reid Hunt and Atherton Seidell report the results of experiments undertaken to establish a method for the determination of mercuric iodide when dissolved in liquid paraffin. Preliminary experiments showed that paraffin, when present even in small amount in solutions of mercuric iodide, interferes with the precipitation of mercury as sulphide. Thus, when a sample of "mercol," reputed to be a 1 per cent. solution of mercuric iodide in a mineral oil, was dissolved in a suitable solvent, such as ether, chloroform, or mixtures of these solvents with alcohol, and hydrogen sulphide passed in, no precipitate was obtained. Ultimately two satisfactory methods were devised. The first of these was based on the observation that a mixture of mercuric iodide and liquid paraffin when heated at the boiling point for several minutes in an inclined tube yields a deposit of salt in the upper part of the tube. It was found that 0.0008 Gm. of the salt in 5 Gm. of liquid paraffin (0.016 per cent.) yielded a faint but perfectly distinct yellow deposit. Of several samples of mercol none gave even a trace of deposit when treated in this way, as was the case with the solutions prepared by heating the ingredients together over a flame until clear solution was obtained, cooling and filtering. It is clear, therefore, that at the ordinary temperature liquid paraffin holds in solution less than 0.016 per cent. of mercuric iodide. The other test depends on the colorimetric detection of iodine. The sample is mixed with more than an equal volume of chloroform and shaken with dilute sulphuric acid containing a few drops of a 1 per cent. sodium nitrite solution. Under

these conditions the chloroform acquires the characteristsc pink color due to iodine, even when the liquid examined contains less than 0.01 per cent. of mercuric iodide. Hot solutions of the salt responded immediately to this test, but cold solutions and mercol gave negative results.—Journ. Amer. Med. Assoc., Jan. 16, 1909, 225.

Sulphurated Mercuric Sulphate—A New Compound.—Estrup describes a new mercuric compound having the empirical formula $4HgO.2HgS.3SO_3.4H_2O$, which was obtained as follows: A solution of mercuric sulphate was prepared by dissolving 10 Gm. yellow mercuric oxide in 10 Cc. concentrated sulphuric acid and 40 Cc. water. To 4 vol. of this solution 1 vol. of carbon disulphide was added and the mixture frequently shaken during 1 to 2 weeks, when a crystalline deposit was formed. The crystals were washed, first with sulphuric acid, then with alcohol, and finally with ether. When dried in the air they proved to be regular six-sided tabular crystals, which are decomposed by solution of sodium hydroxide.—Pharm. Ztg., liv (1909), No. 36, 356; from Ztschr. anorg. Chem., *62* (1909), 168.

ARSENIC.

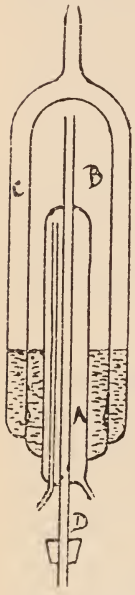
Arsenic—Micro-chemical Recognition.—Denigés recommends the following micro-chemical method for the identification of arsenic, using silver nitrate, in acetic or ammoniacal solution, or magnesia mixture. A drop of the suspected solution is evaporated with a very small flame on a slide until nearly dry, observing that the residue shall not exceed 5 Mm. in diameter nor contain more than 0.025 Mgm. of arsenic. When perfectly cooled a drop of the reagent is then added, and, without resorting to a cover glass, it is examined under the lens. With ammoniacal silver nitrate solution red, hexagonal or rhombic, under circumstances also tetrahedric, stable crystals are obtained; with acetic silver nitrate solution, rhombic dodecahedrons appear; and with magnesia mixture the crystals obtained have the same form as that of ammonium magnesium phosphate, but are arranged in x-form or fern-leaf like. It is important to observe these directions implicitly, for if the reagent is added directly to the solution, amorphous products are formed. The method is available also for arsenic stains. The stain is dissolved in a few drops of concentrated nitric acid and the solution then treated and examined as above described. Pharm. Ztg., liii (1908), No. 99, 981; from Compt. rend., Oct. 5, 1908.

Arsenic—A New, Convenient and Sensitive Test.—Covelli recommends a new test for arsenic which, while even more sensitive than Bettendorf's test, avoids the difficult preparation of the reagent required for the latter. The new test is based on the property of hypophosphorous acid to reduce arsenic trichloride. The reagent must be freshly prepared, which simply requires the solution of 0.5 Gm. calcium hypophosphite in 5 Gm. fuming hydrochloric acid. To carry out the test, 5 vol. of this reagent and 1 vol. of the liquid under examination are heated to boiling and then allowed to

stand quietly. In the presence of arsenic, depending on the quantity, a brownish orange color or a brown precipitate is formed.—Pharm. Ztg., liii (1908), No. 98, 972; from Boll. Chim. Farm., 1908, No. 18.

Arsenic—Apparatus for Gutzeit's Test.—P. B. Dallimon has devised the apparatus shown by Fig. 56, for convenience in carrying out Gutzeit's test for arsenic. *A* is an ordinary condenser, to which a piece, *B*, is fused. This portion has two holes blown near the bottom, as shown, which permits the gas to flow to an outer jacket, *C*. This jacket is drawn out at the top and the mercuric chloride paper is fastened over the orifice. Solution of lead acetate having been poured into *C* and thus reaches the same level in *B*; the generating flask is now attached at *D* and the condensing water turned on. The generated gas bubbles through *B* and *C* and finally reaches the narrow outlet on top of *C* covered with the mercuric chloride paper. Any tendency to suck the lead solution back is obviated by the space at the top of the condenser, which is amply large enough to contain it all.—Pharm. Journ., March 6, 1909, 324.

Fig. 56.



Apparatus for Gutzeit's Test.

Arsenic—Detection in Urine.—E. Salkowski describes two methods of oxidation which he employed in place of the usual mixture of hydrochloric acid and potassium chlorate for the detection of arsenic in urine:

(1) *Fusion Method.*—The neutral (rabbit's) urine was evaporated and extracted with 150 Cc. of alcohol and filtered. On evaporating off the alcohol, the warm residue was treated with 12–15 Cc. of nitric acid (specific gravity 1.48) and evaporated once more. The yellow residue so formed was then disssolved in water containing potassium carbonate and the turbid solution evaporated to dryness in a platinum basin. Fifteen Gm. of a mixture of 2 parts of potassium nitrate with 1 part of sodium carbonate were then added and the whole was fused. The residue was then dissolved in water and the filtrate acidified in a flask with sulphuric acid and boiled to remove carbon dioxide and oxides of nitrogen; after evaporating, the residue was again extracted with alcohol and filtered. The filtrate was then evaporated and the residue dissolved in water and heated for one hour with 8–10 Cc. of concentrated sulphuric acid; on cooling, the solution was diluted with water and introduced into a Marsh apparatus.

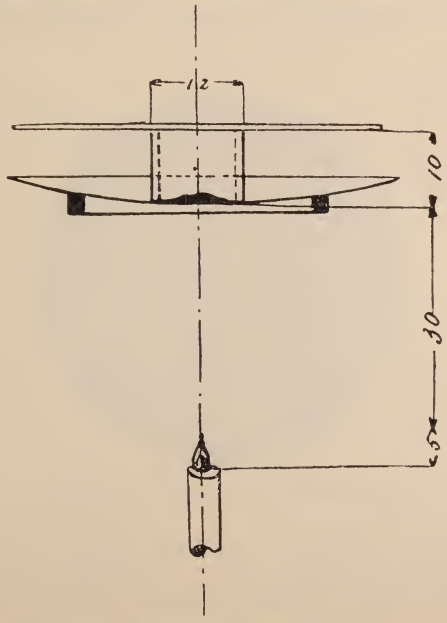
(2) *Modified Newmann Method.*—Instead of oxidizing the evaporated urine itself, the author prefers to oxidize the residue obtained from the alcoholic extract of the evaporated urine. For this purpose, the residue was treated with 15 Cc. of nitric acid (specific gravity, 1.48), while still warm; it was then transferred to a flask, mixed with 10 Cc. of sulphuric

acid and treated from time to time with ½ Cc. of nitric acid (specific gravity, 1.48). If, as is the case in strongly alkaline urines, the arsenic is present as an arsenite or arsenate, it must be looked for, not in the alcoholic extract, but in the residue. This applies generally for ionized arsenic, and serves as a means of distinguishing between ionized and organically combined arsenic. The quantitative estimation of arsenic by Marsh's method is unreliable in the presence of nitric acid or nitrates or traces of sulphide.—Pharm. Journ., Sept. 26, 1908, 402; from Ztschr. f. Physiol. Chem., *56* (1908), 95–114.

Arsenic Testing in Bismuth Salts is the subject of a paper by Virgil Coblentz and Otto May in the "Proceedings" of this Association, 1908, 881–883.

Ammoniacal Arsenic Chloride—Formation and Properties.—Besson and Rosset find that when dry ammonia gas acts on arsenic trichloride at −20° C., a yellow solid is formed having the exact formula $AsCl_3.4NH_3$. The compound sublimes *in vacuo* at 200° C., the sublimate having the formula $2As_2Cl_3.7NH_3$. The compound $AsCl_3.4NH_3$ dissolves in liquid ammonia, but on evaporating the ammonia the original substance is not obtained as a residue.—Chem. News, July 24, 1908, 46; from Compt. rend., *146* (1908), No. 24.

FIG. 57.

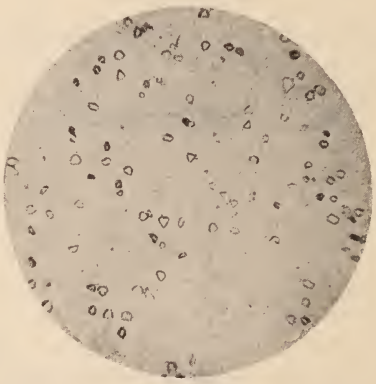


Watch-glass Apparatus.

Arsenic Trioxide—Detection by Micro-Sublimation.—Among the pre-

liminary tests for the detection of arsenic trioxide, the one depending on the formation of a crystalline sublimate in the cool portion of a combustion tube in which the suspected substance is heated, is frequently recommended. With the object of further improving this test and to make it available for a more extended micro-chemical characterization of the sublimate, C. Hartwich and F. Toggenburch have subjected the method to a series of experiments which lead them to recommend the following process and apparatus: A section of glass tube, ground smooth on the edges, about 12 Mm. in diameter and 10 Mm. high, is placed on a watch-glass, as shown in actual size by Fig. 57. The substance to be examined, for example, a mixture of calcined sea-sand and arsenic trioxide containing in 0.1 Gm. from 0.1–0.01 Mgm. of As_2O_3, is placed into the glass tube, which is then covered with an object glass of about 50 Mm. square. The heat of a micro-burner is applied to the watch glass with certain precautions, namely: the flame of the micro-burner should not be more than 5 Mm. high, and should not be nearer to the watch-glass than 30 to 40 Mm.—these dimensions being indicated in the cut; the heating should be continued for 10 to 15 minutes. In this way a white sublimate is formed, which, even if present only in the amount of $\frac{1}{100}$ Mgm. As_2O_3, is plainly visible to the naked eye if the object glass is viewed in a slanting position, and when examined under the microscope without the use of a cover glass, exhibits a field of handsomely developed crystals, as shown by Fig. 58. It

FIG. 58.



Micro-Crystals of Arsenic Trioxide.

may, however, occur occasionally that the sublimate is granular instead of crystalline, notwithstanding the utmost care taken; but in such cases it suffices to breathe upon the sublimate and allow the slide to lay over night, when, as a rule, the sublimate will have assumed the characteristic crystalline form, consisting of remarkably well-developed octahedra and tetrahedra, with now and then some monoclinic prisms. The further

identification of the sublimate then consists in converting the As_2O_3 into a silver salt under specific precautions and directions, the details of which must be consulted in the original.—Schweiz. Wschr. f. Chem. u. Pharm., xlvi (1908), No. 52, 831–834.

Iron Arsenate—Pharmacopœial Variabilities of Composition.—Frederick B. Power and Harold Rogerson have made an experimental inquiry into the composition of iron arsenate as official in different pharmacopæias, namely: British (1898), French (1895), Italian (1892), Spanish (1905), and Mexican (1884). The proportions of ferrous sulphate to sodium arsenate are different in all of them, and, as might be expected, the resulting products differ appreciably in their composition. The compound described in the B. P., 1898 under the title of *Ferri arsenas* (iron arsenate) is defined by the same authority as "ferrous arsenate, $Fe_3(AsO_4)_2,6H_2O$, with ferric arsenate and some iron oxide." This definition of the official compound would lead one to assume that the iron is chiefly in the ferrous state, which, as will appear below, is not the case; nor is there justification for assuming as is indicated, that the ferrous arsenate contained in this amorphous compound is represented by the definite formula given. The authors having prepared small quantities of the compound by the processes of the different pharmacopœias, subjected them to analysis, together with several commercial samples of the B. P. product as supplied by English manufacturers, with the following results:

	Ferrous Iron.	Total Iron.	Arsenic (As).	Proportion of Salts, use in Manufacture.	
				$FeSO_4 7H_2O$.	Na_2HAsO_4.
Brit. Pharm., 1898.....	7.11%	21.15%	28.58%	10	7.6
French Pharm., 1895 ..	4.45%	20.87%	28.15%	10	29.8
Italian Pharm., 1892...	9.10%	24.66%	28.09%	10	6.6
Spanish Pharm., 1905..	6.38%	22.14%	29.70%	10	16.4
Commercial specimen ..	4.62%	26.31%	30.67%	—	—
Commercial specimen..	4.48%	27.19%	29.76%	—	—

The only official standard for the arsenic content of the preparation is that of the Italian Pharmacopœia, viz., 46 per cent. H_3AsO_4, corresponding to 24.29 per cent. As.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 498–507.

Soluble Ferric Arsenate—Preparation and Characters.—In consequence of the generally conceded unsatisfactory character and variable composi-

tion of the iron arsenate of the pharmacopœias (which see), Frederick B. Power and Harold Rogerson suggest the preparation of a soluble ferric arsenate, by a method similar to that of preparing the soluble ferric phosphate of the U. S. P., as possessing decided advantages over the insoluble compounds which are at present officially recognized. The method of preparation is briefly as follows: To an amount of solution of ferric citrate corresponding to 145 parts of the anhydrous salt, add 100 parts of anhydrous sodium arsenate, and heat the mixture gently on a water-bath until the latter salt has become completely dissolved. The bright green solution produced is filtered, evaporated at a gentle heat to a syrupy consistence, and spread out on plates of glass, so that, on drying, the salt may be obtained in scales. *Ferri arsenas solubilis*, thus prepared, forms thin, bright green, transparent scales, which are readily and completely soluble in water, but insoluble in alcohol. The aqueous solution which has a bright green color, has an acid reaction, and is turned brown, but not precipitated, by solution of ammonia. Potassium ferrocyanide gives a blue coloration, which is rendered much deeper in color, with formation of a blue precipitate, on the addition of hydrochloric acid. If 0.5 Gm. of the salt be dissolved in 5 Cc of hot water, and to the solution about 10 Cc. of a 5 per cent. solution of potassium hydroxide be added, a reddish-brown precipitate will be produced. The filtrate from this precipitate, when acidified with HCl, then about 5 Cc. of magnesia mixture added, and, finally, a slight excess of solution of ammonia, will yield a white crystalline precipitate. This precipitate, when washed on a filter with a little water, gives the characteristic chocolate brown color of silver arsenate in contact with a few drops of solution of silver nitrate. Although the composition of this salt is naturally subject to slight variations, soluble ferric arsenate may be assumed to contain from 13 to 13.5 per cent. of arsenic and about 11 per cent. of iron, which would correspond, approximately, to from 34 to 35 per cent. of anhydrous ferric arsenate. The salt should be kept protected from light.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 507–513.

Arsenic—Modern Organic Compounds.—John Humphrey briefly describes the more important organic arsenic compounds in the order in which they have made their appearance.

Atoxyl (*Sodium aminarsonate*) was put on the market a few years ago, and was chemically described as the anilide of meta-arsenous acid, with the formula $C_6H_5NHAsO_2$. Subsequent investigation of this compound by Ehrlich and Bertheim demonstrated that it contained no free amide, but that, in fact, it was the neutral sodium salt of a substance discovered by Bechamp as early as 1863, which the latter had taken to be the anilide of arsenous acid, but has been proven by the former to be *p*-amino-phenyl arsenic acid—the formula of atoxyl being represented thus:

$$C_6H_4<\begin{matrix}NH_2\\AsO.OH.ONa\end{matrix} + 4H_2O.$$

Atoxyl is an extremely stable compound, neither arsenic nor aniline being easily separated from it by chemical means; but its aqueous solutions are less stable, pure aniline having been found present in solutions which had been exposed to diffused light, while on boiling the solutions are decomposed with liberation of the extremely poisonous arsenic acid. While containing 24 per cent. of arsenum, atoxyl is only about one-fourth as toxic as arsenous acid.

Soamin (*Sodium Aminarsonate*), which next made its appearance in England, is described as *p* aminophenylarsenate, and appears to differ from atoxyl only in the amount of water of crystallization, containing 5 instead of 4 mol. H_2O. There appears, therefore, no essential difference in the two compounds. Soamin is soluble in about 5 parts of water, contains 22.8 per cent. of arsenum, and has only one-fortieth the toxicity of arsenous acid.

Arsacetin (*Sodium Acetarsonate*), a more recent preparation, is "acetyl atoxyl." It was discovered by Ehrlich, and apparently possesses distinct advantages over the two varieties of sodium aminarsonate before mentioned. It is produced by acetylation, *i. e.*, by introducing the acetyl radical into the free amino group in the atoxyl, and has the formula:

$$CH_3CO.NH.C_6H_4(AsO)<\begin{matrix}OH\\ONa\end{matrix} + 4H_2O.$$

Arsacetin is absolutely free from arsenous and arsenic acid, and three times (in maximum four to five times) less toxic than atoxyl or soamin. Moreover, in contrast to these, the solutions of arsacetin withstand boiling absolutely; for, even when heated up to 130° C. for one hour in an autoclave, no decomposition takes place.

Ursudan (*Sodium Acetarsonate*) is a recently introduced acetyl derivative which has been described as "sodium 3-methyl-4-acetylaminophenylarsenate. It is an anhydrous compound, soluble in 3 parts of water, and was stated to contain 25.4 per cent. of arsenium (As) in organic combination.—Pharm. Journ., Jan. 23, 1909, 83–84.

Arsenic—Absorption in the Animal Organism.—Dr. W. H. Bloemendal communicates a comprehensive study, undertaken at the suggestion of Dr. L. van Itallie, with the object of determining the extent to which arsenic is absorbed in the animal organism. The results show that while all the organs of the animal give evidence of the presence of arsenic after its administration, the amount absorbed varies with the particular organ. The nails will contain the largest amount, which is progressively reduced in the other organs in the following order: Hair, spleen, thyroid gland, cuticle, lung, liver, kidney, heart, bone, flesh, sexual organs and brain. The hair may contain arsenic when such is absent in the other organs and

no arsenic has been administered. Normal urine is free from arsenic, which is, however, rapidly absorbed, and may be detected in a short time after the administration of arsenic. Arsenic is not transmitted after administration into the milk of cows, goats, cats or rabbits, and into human milk only in extremely small quantities. Both in man and animals traces of arsenic may be found under normal conditions, but this is of no physiological significance, and can only be regarded as an accidental impurity. Arsenic does not enter the foetal circulation.

Incidentally, the author finds that cacodylic acid is converted in the organism partly into As_2O_3 or As_2O_5, and that after the administration of sodium cacodylate a small quantity of arsenic is eliminated from the body in gaseous form. Also, that hydrochloric acid may be completely freed from arsenic.—Arch. d. Pharm., *246*, No. 8 (Nov. 14, 1908), 599–617.

ANTIMONY.

Antimony and Tin.—Separation.—For the separation of antimony and tin, G. Panajotow obtains very good analytical results by a method which depends on the insolubility of antimony sulphide in a 15 per cent. solution of hydrochloric acid, whereas tin sulphide is soluble. In carrying out the separation a mixture of the two salts containing about 15 per cent. hydrochloric acid is heated over a water-bath to 50–60° C., and treated with a rapid stream of hydrogen sulphide for half an hour; the liquid is then cooled to below 30° C., and treated for ten minutes more with a slower stream of gas. The precipitate after being filtered on a Gooch filter is washed with a little water containing hydrogen sulphide to remove any tin and weighed after treatment with alcohol, carbon disulphide, and ether; the filtrate is partially neutralized with ammonia and precipitated with hydrogen sulphide for the estimation of the tin.—Pharm. Journ. June 12, 1909, 795; from Berichte, *42* (1909), 1296–1299.

Antimonium Sulphuratum—Difficulty to Obtain a Clear Filtrate in Sulphur Determinations.—F. H. Alcock finds that in the determination of the total sulphur in antimonium sulphuratum, much difficulty is experienced in removing the soluble sulphate after oxidation, caused by the antimonous oxide passing through the filter paper, even when double or treble layers are used. This difficulty may be overcome by the addition of weak solution (2 per cent.) of ammonium chloride, which answers admirably. Moreover, in the subsequent operation of precipitation of the barium sulphate, a granular, easily collected and easily washed precipitate is ensured.—Pharm. Journ., April 24, 1909, 555.

Silver—New Method of Estimation with Starch as Indicator.—Roscoe W. King remarks that to silver belongs the unique distinction of forming, more insoluble compounds than any other known metal. For this reason, and for other reasons, it is a valuable reagent in volumetric analyses; and

methods for its accurate estimation, especially in the presence of free nitric acid, are of considerable importance. Obviously, if to a solution containing a substance capable of forming an insoluble compound with silver this reagent is added in excess, the determination of the excess in the filtrate will furnish the necessary data for accurately computing the quantity of the substance entering into the insoluble compound; and this estimation of the residual silver constitutes, as is well known, a very accurate and convenient method for determining iodine, bromine and chlorine. Among the best methods for the estimation of silver, the potassium chromate (Mohr's), and the thiocynate (Volhardt's) methods are most frequently recommended, but neither of these, as pointed out by the author, are quite as delicate as the new method which he now proposes. In this method, which depends on the use of a starch indicator of particular composition, the end-point obtained in the iodometric method proposed is so exceedingly delicate and distinct that the addition of 0.05 Cc. of $\frac{N}{10}$ KI solution in excess will transform 500 Cc. of the colorless fluid into a deep blue solution. The change is sudden and definite, and can be clearly seen by an observer standing several meters distant. The reagents necessary are:

1. *Decinormal Silver Nitrate in Nitric Acid*, containing 16.966 Gm. $AgNO_3$ and 100 Cc. conc. nitric acid in 1000 Cc.

2. *Decinormal Potassium Iodide Solution*, and the

3. *Starch-nitrite Indicator*, which is prepared as follows: About 800 Cc. of distilled water are heated to boiling, and 25 or 50 Cc. of it are poured over 12 Gm. of corn starch in a small beaker.

The starch paste is then added to the remainder of the water, and the whole allowed to boil gently for two or three minutes. When cool, 100 Cc. of an 0.8 per cent. solution of sodium nitrite and 25 Cc. of pure chloroform are added, and the volume is adjusted with water to 1000 Cc. This indicator should be kept well stoppered, and should be well shaken before using.

The Direct Estimation of Silver is illustrated in the following process for standardizing the KI solution: Ten Cc. of the decinormal silver solution are diluted with distilled water to approximately 100 Cc. Add 10 Cc. of the starch-nitrite indicator and run in the KI solution from the burette. The blue color which forms rapidly disappears on stirring until near the end, when the color begins to linger. The KI solution is then added more slowly with constant stirring, until finally a point is reached when on addition of only one drop or less of the KI solution the colorless liquid becomes deep blue. The blue color is discharged by the addition of one drop of the silver solution, and restored on adding an equivalent amount of KI.

The chemical changes are explained as follows: When the starch indicator, containing the sodium nitrite, is added to the fluid containing nitric

acid, nitrous acid results; and on the addition of KI solution iodine is liberated, and immediately combines with the starch to form the well-known blue iodide of starch, which is rapidly decomposed by the silver nitrate with precipitation of insoluble silver iodide. When all the silver has been precipitated the slightest excess of the iodine unites with the starch to form a permanent compound. Hill states that a fluid containing one part of free iodine in 300,000 will turn blue on the addition of hydrated starch. This appears to the author to be a very conservative statement. Detailed directions are given by the author for applying the method to the estimation of chloride in aqueous solutions and in urine.—Merck's Rep., Mar., 1909, 57–58.

Silver Leaf—Substitution of Aluminum.—F. H. Alcock, having his suspicion aroused by the not very silvery appearance of a book of silver leaf recently purchased, subjected it to chemical tests and found it to consist simply of impure aluminum. A subsequent examination of silver leaf in the stock of his pharmaceutical acquaintances proved them all to be pure silver leaf.—Pharm. Journ., Nov. 21, 1908, 653.

Silver Chloride and Iodide—Convenient Method of Separation.—Baubigny recommends for the separation of silver chloride and iodide that the mixture of the two salts be heated at 70°–80° C. on the water-bath with a solution of commercial ammonium carbonate containing 100 Gm. of this salt and 40 Cc. of 10 per cent. ammonia water per liter, removing the liquid after cooling by filtration, treating the precipitate once more in the same way, and, after collecting the residual silver iodide and washing it with a dilution of the same alkaline carbonate, drying it to constant weight. In the filtrates and washings the silver chloride is then determined with nitric acid in the usual way.—Pharm. Ztg., liii (1908), No. 81, 797; from. Bull. Soc. Chim. France, iv, vol. 3 (1908).

Silver Sulphide—Reaction with Silver Sulphate and Use for Preparing Dark-Colored Glass.—O. Sackur observes that when a mixture of silver sulphide and sulphate is heated above 300° C., sulphur dioxide and metallic silver are formed. Attempts to determine the equilibrium pressure of the mixture failed, the only result being the proof that the pressure is greater than ten atmospheres at 300° C. If the mixture is heated in a tube of ordinary Thuringian glass, the latter acquires a brown color below 400° C.; this color becomes darker and turns reddish when the mass is left in contact with the glass for some time. It is not distributed uniformly throughout the whole mass, but only over a relatively thin surface layer. Glass colored by this method absorbs the blue and blue-green rays of the spectrum almost completely, and the yellowish green rather less, and vessels thus colored may very conveniently be used for photographic purposes to absorb the most actinically active rays. When the brown glass is heated in a Bunsen flame tempering colors are produced owing to

the formation of a very thin layer of metallic silver on the surface. A distinct silver-white layer is obtained by heating in the blowpipe flame. The brown and reddish-brown glass possesses a small but decided conductivity for the electric current at the ordinary temperature.—Chem. News, Dec. 4, 1908, 281; from Ber. d. D. Chem. Ges., *41* (1908), No. 14.

Silver Iodide—Solubility in Ammonia.—H. Baubigny finds that the solubility of silver iodide in ammonia is much less than has hitherto been believed. At 16° C., its solubility in ammonia of sp. gr. 0.926, is roughly in the proportion of 1 : 6000.—Chem. News, July 24, 1908, 46; from Compt. rend., *146* (1908), No. 24.

GOLD.

Gold Chloride—Reduction to Colloidal Metal by Aluminum.—Dauvé finds that when a small piece of aluminum foil is immersed for some hours in a solution of gold chloride, colloidal gold is formed, imparting a fine purple color to the solution viewed by transmitted light; by reflected light it has a dull yellow appearance. The reaction does not occur in the presence of excess of aluminum chloride. Since commercial aluminum invariably contains a trace of iron this metal also probably takes part in the reaction.—Pharm. Journ., April 24, 1909, 556; from Journ. d. Pharm. et Chim., *29* (1909), 241.

Gold and Sodium Chloride—Correction of U. S. P. Assay.—Virgil Coblentz and Otto B. May find that when the assay of gold aud sodium chloride for gold is carried out strictly according to the U. S. P., the yield is invariably low. This is due to the fact that the hydrogen peroxide is completely decomposed before all the gold is reduced to the metallic state, a fact which was also noted by Vanino, who proposed the method, and who has since suggested the reduction of the gold salt by means of formaldehyde in place of H_2O_2, according to the following method: If 0.3 Gm. of gold and sodium chloride be dissolved in 25 Cc. of water contained in a porcelain dish, the solution made alkaline by the addition of 5 Cc. of potassium hydroxide, T. S., and, after the addition of 5 Cc. of solution of formaldehyde, heated for about one hour on a water-bath, a precipitate of metallic gold will be obtained, which, when washed with water acidulated with HCl, dried and ignited, should weigh not less than 0.09 Gm. (corresponding to at least 30 per cent. of metallic gold. The authors recommend this assay process for future revision, and that when following the present assay method, a second portion of hydrogen peroxide be added after the first portion has been consumed.—Merck's Report, July, 1908, 169.

ORGANIC CHEMISTRY.

Hydrocarbons.

(*Including Volatile Oils and Derivatives.*)

Alpha-Naphthol—A New Reaction.—M. Dane describes a new reaction for the detection of alpha-naphthol in beta-naphthol as follows: A small quantity of the substance is dissolved by means of a solution of caustic soda or potash, and a few drops of formic aldehyde are added. If heated a green coloration is immediately produced, changing to blue and then to deep blue. Without heat the reaction is slower. With free access of air a brown precipitate eventually results, but when the liquid tested is protected by a floating layer of liquid paraffin, the precipitate remains blue. The author has not so far determined the nature of the precipitate, but he points out that the reaction is also characteristic of formic aldehyde; with ethylic aldehyde it does not occur. Beta-naphthol treated in this way does not give any color, and the test is therefore a means of examining that body for the presence of alpha-naphthol.—Pharm. Journ., Feb. 13, 1909, 188; from L'Union Pharm., Jan. 13, 1909, 1.

α- and β-Naphthol—Simple Tests of Distinction.—According to Voley-Boucher the following is a very simple method for distinguishing between alpha- and beta-naphthol: Just sufficient alcohol is added, drop by drop, to 0.5 Gm. of the naphthol in a test-tube to dissolve it. To this solution 2 Cc. of cupric sulphate, 10 per cent., and 4 Cc. of freshly prepared potassium cyanide solution of the same strength are added, shaking up well after adding each reagent. *α*-naphthol gives an abundant violet-red precipitate; *β*-naphthol a yellow one. On adding just sufficient alcohol, 95 per cent., to dissolve the precipitate, that with *α*-naphthol gives a solution which is rose-colored by transmitted light, and violet by reflection; *β*-naphthol gives an orange-yellow solution. The same test serves to differentiate the camphorated naphthols, also to detect the presence of 1 part of *α*-naphthol in 2,000 parts of *β*-naphthol. The method is applicable to the approximate determination, colorimetrically, of *α*-naphthol. Benzonaphthol gives no color with the test, so it may be used to detect the presence of either naphthol in the free state as impurity in that compound. —Pharm. Journ., July 25, 1908, 82; from Repértoire, *20* (1908), 289.

Hexane and Heptane—Unsatisfactory Commercial Supply.—Edw. Kremers calls attention to the unsatisfactory character of "hexane" and "heptane" imported last year through a St. Louis firm from a German manufacturer of chemicals. On fractionating them they were both shown to be mixtures of hydrocarbons of variable boiling-points, the "heptane" in particular being evidently sophisticated with "benzene," and neither of

them corresponding to the composition indicated by their labels. The evidently willful addition of benzol to these petroleum hydrocarbons is noteworthy.—Midl. Drugg. and Pharm. Rev., Mar. 1909, 55–56.

Petroleum—Distinction of Source According to Ozonides Produced—The fact that most petroleum is optically active was first observed by Rakusin, and was attributed by him to the presence of optically active acids, produced by the decomposition of animal or vegetable proteins. Marcusson, however, considered that the optical activity was caused by the presence of decomposition products of cholesterol. To test the latter view, E. Molinari and P. Fenaroli have subjected petroleum from different sources to the action of ozonized air at 10° C., and have obtained various solid ozonides; since the formation of these substances has no effect on the optical activity or the sample, the activity cannot be due to cholesterol or any other unsaturated compounds. The ozonides obtained from Russian and Roumanian petroleum are derived from an unsaturated hydrocarbon, $C_{17}H_{20}$, while that obtained from Italian petroleum is derived from a hydrocarbon, $C_{15}H_{16}$; these substances should serve as a means of distinguishing different samples of petroleum.—Pharm. Journ., Jan. 9, 1909, 32; from Berichte, *41* (1908), 3704–3707.

Petroleum—New Distinctive Color Reaction.—According to C. Arragon, the following test distinguishes Austrian from American petroleum: Equal parts of the petroleum and pure nitric acid (of specific gravity 1.400, and which has been completely freed from nitrous acid by boiling with urea) are placed in a glass-stoppered cylinder, and mixed by vigorously shaking for half a minute. Pure American petroleum thus becomes colored a beautiful violet, while the under layer is colored yellow. Austrian, Galician, or Russian petroleum is colored an intense yellow, the acid layer brown. In a mixture of the latter petroleums with the American variety, the oil layer is first colored faint violet, and then, on shaking for ten to twenty-five seconds, suddenly becomes yellow, the end reaction being the same as that of the Austrian oil. This color reaction is so delicate that a mixture of 10 per cent. of Austrian oil in American petroleum may easily be detected.—Pharm. Journ., Jan. 16, 1909, 60; from Chem. Ztg., Jan. 7, 1909, 20.

Benzin vs. Benzole—Confusion in Terms by which They are Known.—Having for years made it a *hobby* to collect data regarding the various terms by which benzin (the hydrocarbon of petroleum) and benzole (the hydrocarbon from coal tar) are known throughout the literature, Otto Raubenheimer contributes a very interesting and exhaustive paper on the subject which deserves attention and should do much towards clearing the confusion that exists to the present day regarding the terms "benzin," "benzine," "benzene," "benzol," "benzole," and "benzoline. The coal tar derivative, benzole, was discovered by Faraday (in 1825), and origi-

nally called, according to its chemical formula ($=C_{12}H_6$, old notation), "bicarburet of hydrogen." Mitscherlich about the same time obtained this hydrocarbon by distilling benzoic acid with lime, and called it "benzine;" but Faraday objected to this name, especially the end syllable "ine," (which is the ending adopted for alkaloids), and accordingly called it "benzole." From the data produced by Mr. Raubenheimer, which must be consulted in the original, it becomes apparent that the acceptance of Mitshlich's term "benzine," on the one hand, or of Faraday's term "benzole," on the other, by the writers of different nationalities, gave rise to the existing confusion when the term "benzin" was applied to the hydrocarbon from petroleum. The French to this day designate benzole by the term "la benzine," and similar confusion exists in Italy and in other Latin countries. In Germany and all German-speaking countrles no confusion exists. Petroleum benzin is called "benzin" (or benzinum petrolis), and coal tar benzene is called "benzol," and the same distinction prevails in this country, ths petroleum product being designated as "benzinum" or "petroleum benzin," while the coal-tar product is officially mentioned as "benzene." In England, on the other hand, much confusion exists, for here we have such terms as benzine, benzene, and benzoline, and as synonyms for the official (B. P.) benzol in text books in common use. The author suggests that all confusion will be avoided by the adoption of the simple term of Faraday "benzole," for the coal-tar product, and "benzin" for the petroleum distillate.—Chem. & Drugg., July 25, 1908, 144.

Benzoline vs. Benzine—A British Criticism.—Referring to Mr. Raubenheimer's account concerning the confusion arising from the use of the words "benzin," "benzine," "benzene," "benzol," and "benzoline," D. B. Dott remarks that Mr. Raubenheimer's conclusions seem quite open to criticism. It is admitted that the names "benzine" and "benzole" were originally given (1825) to a compound C_6H_6, so-called because it was obtained by distilling benzoic acid with lime. Mr. Raubenheimer's statement of facts is incomplete in so far as he does not mention who, or which nationality, is responsible for the subsequent application of the name "benzine" or "benzin" to a petroleum distillate consisting chiefly of paraffins. This was quite evidently a blunder, and it is the perpetuation of this blunder that causes the trouble and confusion. Regarding the term "benzoline," Mr. Dott admits that the term may be open to objection, but it is nothing like so bad a name as "benzin," which Mr. Raubenheimer advocates. The only possible remedy for the confusion is for people in America and in Britain to drop the words "benzin" and "benzine," as applied to a petroleum distillate, and Mr. Raubenheimer might use his influence in that direction with our friends on the other side of the ferry.—Chem. & Drugg., Aug. 29, 1908, 369.

Benzine—Origin of the Name as Applied to the Petroleum Product.—In

a rejoinder to the preceding criticism, in which Mr. Dott wants to know which nation is responsible for the application of the word "benzene" to the petroleum distillate, Mr. Raubenheimer says that, as he has previously explained, it was Professor Mitscherlich, of Berlin, who coined the word. Liebig, in an editorial note on Mitscherlich's memoir, changed the name to "benzol," as the latter ending corresponds better to its properties and mode of preparation. Unfortunately, the British adopted and still use the term for coal-tar distillate. Later on this was changed into "benzene," and British chemists now speak of the benzene ring. The product from fractional distillation of petroleum (crude oil) was supposed to be identical, and was therefore also named "benzine" or "benzene," making the confusion worse. J. G. McIntosh, in his translation (1901) of Neuburger and Noalhat's "Technology of Petroleum," calls the petroleum distillate "benzene," and the same term is used by B. J. Crew in his "Practical Treatise on Petroleum" (1887). Schorlemmer, in England, isolated (1863), compounds, and originally published the statement, not substantiated by further analysis, that "benzene" (benzole) and toluene (toluole) were obtainable by distilling American petroleum. Therefore, if the British thus found "benzene" or "benzine" in American petroleum, they were perhaps justified in naming the petroleum distillate "benzine." For the two reasons given it is Mr. Raubenheimer's belief that the name "benzine" is of British origin.—*Ibid.*, Dec. 5, 1908, 878.

The Volatile Oils, 1901 to 1903, a series of papers by I. W. Brandle in which he reviews the work done during the period indicated (see Proceedings, 1908, 308), is continued in Pharm. Rev., Aug., Sept. and Dec., 1908, 246–248, 278, and 371–374, and in Mdl. Drugg. and Pharm. Rev., April and June, 1909, 110–114, and 248–252.

The Essential Oils of the B. P. "Codex"—Critical Review.—C. T. Bennett publishes a critical review of some inaccuracies in the description of the essential oils mentioned in the B. P. "Codex," which are particularly interesting since the author's criticisms are based on the examination of a very large number of samples of various oils during the past ten years in the analytical laboratory of one of the foremost English drug houses. The paper must be consulted in the original in Pharm. Journ. News, Nov. 14, 1908, 622–624.

Volatile Oils—General Characterization Proposed for the G. P.—Among the propositions for the new revision of the German Pharmacopœia (D. A. B., V.), that of Dr. Hugo v. Soden is one of the most interesting. Dr. v. Soden suggests that the volatile (ethereal) oils be separated from the fixed oils, and that they be considered as a distinct class by themselves, preceded by a brief general characterization—perhaps as follows:

Olea Ætherea—Ethereal Oils.—"The mixtures of volatile odorous substances of numerous plants, which are generally obtained by distillation

with water vapor and are freed from associated substances (resins, coloring matters, malodorous admixtures, etc.) that exert an unfavorable influence on their rational application by rectification and by such other adequate treatment as may be necessary. They constitute clear, oily fluids, which generally contain small quantities of water, derived from the distillation. They are to be preserved in well-filled bottles in a cool place protected from light."

Regarding the method of purification, Dr. v. Soden expresses the opinion that, under certain limitations, this should be optional with the manufacturers of volatile oils, since this necessarily depends on the individual character of the oil requiring purification. The method contemplated by the adoption of the principal odorous constituent of the oil—such as anethol for oil of anise, eugenol for oil of cloves, carvone for oil of caraway, etc.—has the obvious advantage of supplying a single body, recognized as being the active component and of definite composition, and excluding the more or less obscure and sometimes harmful secondary constituents of the oil. Moreover, the determination of identity and quality of a single body having accurately established chemical and physical characters is far simpler and certain than that of a complex mixture of bodies, such as the natural volatile oils, the adulterations of which can often only be recognized with difficulty and with a large sacrifice of material, while occasionally such are not recognizable with any certainty at all.

Regarding the nomenclature, the practice of retaining the original name of the volatile oil for the principal constituent adopted as a substitute, for example, oleum anisi for anethol, is not commendable. It is quite as incorrect as unnecessary, and leads to confusion. It may be expedient, however, to introduce in the alphabetical order the reference, "Ol. Anisi —see Anethol," and to call attention under "Anethol" to its substitution in place ol. anisi.

Concerning the methods of examination, the determination of the "optical rotation" of volatile oils is unquestionably necessary, although this will impose on the pharmacist a considerable expenditure for the polariscope required. Most volatile oils deflect the ray of polarized light either to the right or left, and the determination of the degree of such deflection is important, and frequently indispensable, in connection with the other tests for establishing their purity.

The determination of solubility of volatile oils, instead of being made with diluted alcohol (= 68°–69° C.) as now directed in the G. P., IV, should be made with alcohol of 70 per cent. by volume, the strength generally adopted in industrial examinations. Failure to recognize this practice has given cause for numerous reclamations and explanations, for example, in the case of the prescribed solubility of ol. santali (= 5 p. spir. dil. at 20° C.), which in most instances is not attainable.

Determinations of the boiling-point may, in the opinion of the author,

be omitted. They require large quantities of substance and yield concordant numbers only under the most scrupulous observance of the prescribed precautions.

Furthermore, the author observes that the estimation of the proper quality of a volatile oil does not end with the determination of its chemical and physical properties, but must be supplemented by a comparison of its odor with that of typical specimens of oils of undoubted purity. This may be done by dropping several drops of the oil under examination and of the typical specimen on separate strips of filter paper of equal size and shape, and alternately smelling the papers so imbued with oil. With a little practice, this odor test usually serves well to recognize the quality of an oil, which is then in most cases confirmed by the chemical and physical examination.

The author has examined the volatile oils now official in the G. P. IV, and gives a brief description of their chemical and physical properties, together with such comments as may serve well for the approaching revision.—Pharm. Ztg., liv (1909), No. 25, 249–251.

Volatile Oils—Preliminary Methods for Determining Purity.—Dr. G. R. Pancoast and W. A. Parsons, in view of the fact that a large majority of retail druggists have neither the time nor the necessary apparatus to determine whether the essential oils that they use fulfil the requirements of the U. S. P., and consequently rely upon the integrity of the firm from whom they obtain their supplies, suggest that this policy should be supplemented by various preliminary methods for approximately determining the purity of the oils, which with some experience can be expeditiously carried out by the busy pharmacist, and in many instances lead to the detection of inferior oils. A comparison of the odor, taste, color and physical appearance with typical samples of genuine oils, and in particular, their solubility in alcohol of certain strengths and proportions, will with a little practice lead to good judgment regarding their quality. In the present paper the authors call attention to some conditions which may make such preliminary examination doubtful in certain cases, and also append a table giving the characteristic properties of the official oils.—Amer. Drugg., June 14, 1909, 329–330.

Volatile Oils — Characteristic Reaction with Phloroglucinol Hydrochloride.—R. Kobert finds that volatile oils produce with phloroglucinol hydrochloride certain color reactions, which he considers to be due to the allyl group—$CH_2.CH:CH_2$—contained in them. The reagent is prepared by dissolving 1 p. of phloroglucinol in 10 p. of alcohol, and adding to each Cc. of this solution several Cc. of strong hydrochloric acid. If 1 drop of the oil, or a small crystal of a solid, is added to 1 Cc. of this reagent, the following color reactions are produced: The oils of mustard, clove, pimento, dill, neroli, jaborandi, tarragon, basil, lavender, Peruvian

balsam, parsley, and sassafras give a fine red color. Bergamot, anise, eucalyptus, curled mint, rosemary, and citronella show a reddish-brown tint. American peppermint oil becomes dull red on warming with the reagent; Japanese peppermint, yellow, and Mitcham peppermint, pale red. When terpene-free, the latter gives a dull red color. Natural oil of scurvy-grass turns brown, the synthetic oil gives a whitish mixture. Linalol, eugenol, safrol, myristicol, methyl chavicol, apiol, geraniol, and cinnamic aldehyde all give an intense red color.—Pharm. Journ., Aug. 1, 1908, 112; from Ztschr. Analyt. Chem., through Annales Chim. Analyt., *13*, (1908), 287.

Alpha- and Beta-Ionones—The Genesis of Their Production and Their Importance in Perfumery.—Professor Samuel P. Sadtler gives an interesting account of the investigation that has led to the discovery and final production on a commercial scale of the synthetic bodies, alpha- and beta-ionone, now extensively used in the manufacture of violet perfumes. Professor Tiemann, after his achievement of the artificial production of vanillin (1875) from the coniferin of pine cones, succeeded in isolating the odoriferous principle of the orris root and violet, which he called "irone" ($C_{13}H_{20}O$). In the endeavor to prepare a synthetic compound of the same formula as irone and, if possible, of the same odor, he succeeded by the condensation of citral, $C_{10}H_{16}O$, with acetone, C_3H_6O, to obtain a compound of the composition $C_{13}H_{20}O$; but this compound was not the same as "irone," and had an odor only slightly recalling that of violet. He found, however, that by the action of dilute acids he could convert the new compound—an open chain ketone—into an isomeric ketone, cyclic in structure, which had in the fullest degree the violet odor, and in very diluted form served as the basis for artificial violet perfumes. The ketone first obtained was therefore called "pseudo-ionone, and the product was patented under this name in 1893 (in the U. S. in 1896). In 1897, however, a Swiss firm called attention to a violet essence, or "ionone" of slightly different properties, and further investigation led Tiemann in the following year (1898) to announce the existence of two isomeric and physiologically different ionones, namely, *a-ionone* and *β-ionone*, and that one or the other predominated according as the conversion of the "pseudo-ionone," was effected by dilute acids (the method of his 1893 patent) or by concentrated acid in the cold—the latter being protected by a U. S. patent in 1898, issued to Professor Tiemann's French business associate Edgar De Laire.—Amer. Journ. Pharm., April, 1909, 181–184.

Benzaldehyde—Determination in Almond Flavoring Extract.—W. Denis and P. B. Dunbar recommend a method for the determination of benzaldehyde in flavoring extracts which is based on the precipitation of benzaldehyde as its phenol hydrazone by means of a reagent composed of 1 Cc. of phenyl hydrazine, 1.5 Cc. of glacial acetic acid, and 20 Cc. of water,

prepared immediately before use. Two 10 Cc. portions of the almond extract are treated respectively with 10 Cc. and 15 Cc. of the reagent in stoppered flasks, and after shaking, the mixtures are allowed to stand over night. 200 Cc. of water are then added to each flask, the precipitates collected in Gooch crucibles on asbestos, washed with cold water and then with 10 Cc. of 10 per cent. alcohol, and dried *in vacuo* over sulphuric acid or for three hours at 70° to 80° C. in a vacuum oven. It is advisable to make the second determination with 15 Cc. of reagent, because although most almond extracts contain only about 1 per cent. of oil of bitter almonds, occasionally samples are met with containing as much as 6 per cent. of benzaldehyde. The method gives results corresponding to 97 to 99 per cent. of the theoretical ones, and the accuracy is not affected by the presence of benzoic acid or nitrobenzene.—Pharm. Journ., June 26, 1909, 862; from Journ. Ind. and Eng. Chem., 1909, 1256.

Synthetic Borneol—Production from Turpentine Oil.—Dr. G. Weigel observes that since synthetic camphor has acquired a firm footing on the market, "synthetic borneol," which (in the form of borneol, isoborneol, their esters, and isobornylacetate) constitutes an intermediary product of the preparation of camphor from turpentine oil, is also found on the market. Natural borneol or borneo-camphor, as is well-known, is the the camphor-like product obtained from *Dryobalanops aromatica*, Gaertn., and is employed in its native home as a fumigatory in certain religious ceremonies. Artificial borneol, obtained by reduction from alcoholic solution of natural (laurel) camphor with metallic sodium has, however, long been exported from Europe to supply the deficiency of the natural borneol in the East, and it therefore seems justified to assume that the truly synthetic borneol, obtainable from oil of turpentine will now enter into successful competition with the artificial product from natural camphor heretofore supplied. Synthetic borneol from oil of turpentine, it is true, varies decidedly in some of its physical properties from the artificial borneol heretofore supplied, for, while the two are alike in crystalline form, the alcoholic solution of turpentine borneol deflects polarized light to the left and its melting-point is a few degrees higher than that of camphor borneol, which deflects to the right. It is apparent, therefore, that the turpentine borneol is largely composed of isoborneol, while in camphor borneol, as in the natural borneol, dextro-borneol is present in preponderating quantity. The odor of the turpentine borneol is somewhat different, not so characteristically ambra-like, but fainter and sweetish, reminding of rose.—Pharm. Zentralh., xlix (1908), No. 45, 917.

l-Campholic Acid—Properties—Guerbet has obtained *l*-campholic acid from *l*-borneol in the same way as *d*-campholic acid is obtained from *d*-borneol. The new acid resembles the dextro-rotatory acid very closely. It melts at 106°–107° C., and boils under normal pressure at 225° C. Its

optical rotation at 15° C. is $(a)_D = -49°$ C. The formation of its esters is quite difficult, but reciprocally these are very resistant to saponification. On the other hand, its salts are very easily split up by hydrolysis. The author prepared the anhydride, the chloride and the amide of the new acid.—Pharm. Ztg., liv (1909), No. 19, 187; from Journ. de Pharm. et Chim., 1909, No. 5.

Eugenol—Oxidation by the Oxidizing Enzyme of Fungi.—Cousin and Hérissey in continuation of their study of the oxidation products resulting from the action of oxidizing enzymes of certain fungi on the phenols (see Thymol), have determined that the product resulting from the reaction with eugenol is

Dihydrodieugenol, $C_{20}H_{22}O_4$, and that this bio-chemical product is identical with that obtainable by the purely chemical reaction with ferric chloride. The bio-chemical process is conducted by dissolving 5 Gm. of eugenol in 20 Cc. of alcohol, diluting this solution with a large bulk of water, shaking well, filtering, adding 10 Cc. of a glycerin extraction of *Rusulla delica*, and passing a constant current of air through the liquid. The oxidation of the eugenol is completed in two or three days. By the chemical process with ferric chloride, the conversion into dihydrodieugenol is completed within 24 hours, and the introduction of a current of air is, of course, not necessary.—Pharm. Ztg., liii (1908), No. 72, 702; from Compt. rend., *146*, 1413.

Thymol—Action of the Oxidizing Enzyme of Mushrooms.—Prof. Em. Bourquelot having observed that aqueous solutions of thymol when subjected to the action of the oxidizing ferment of edible mushrooms (champignons), under free access of air rapidly assumes a whitish turbidity which gradually forms a deposit of the same color. H. Cousin and H. Hérissey have subjected the deposit formed under the conditions, selecting for the production of this oxidation product two different species of mushrooms—namely: *Russula delica*, Fr., and *Lactarius controversus*, Fr., and succeeded in isolating from it a perfectly colorless, leafy-crystalline product, which they prove to be identical in all of its characters and composition with

Dithymol, a derivative of thymol which Dianine (in 1882) obtained by the reaction of neutral ferric chloride on warm dilute solutions of thymol in the presence of calcium carbonate. Incidentally, also, they find that by a modification of the chemical method of Dianine, which they describe, the conversion of thymol into dithymol may be effected at the ordinary temperation. As regards the bio-chemical method, the oxidation product obtained by means of *Russula delica* (glycerite 1:2) is more readily purified than when *Lactarius controversus* (juice) is employed. The important deduction to be drawn from these investigations is that the antiseptic action of thymol must in some cases prove inferior because of

the apparent ease with which by the presence of the oxidizing enzyme of certain fungi it is converted into dithymol—a body which possesses no antiseptic action whatever.—Arch. d. Pharm., *246* (1908), No. 5, 325–328.

Terpin Hydrate—Reactions.—E. Isaard finds that on treating terpin hydrate with pure concentrated sulphuric acid a color varying from chrome-yellow to rose-salmon, according to the quantity of material present, is produced; the substance dissolves and a characteristic aromatic odor is evolved. On the addition of 10 per cent. solution of sodium hydroxide the aromatic odor is more pronounced and the coloration disappears; the addition of water likewise dispels the color. Phosphoric acid acts like sulphuric acid but less energetically; in this case the terpin hydrate dissolves, but without coloration, while the aromatic odor is perceptible; on heating, the rose-salmon color appears. These two reagents appear to act as dehydrants. When terpin hydrate is treated with sulphuric acid, and then with nitric acid, there is at first the yellow coloration previously referred to, as well as brown striæ with coloration of the liquid, and resinification of the terpin. On treating at first with nitric acid it dissolves without coloration, and a drop of sulphuric acid placed in the center of the liquid produces a red spot at the point of contact and a rose-salmon coloration all round. Treated with ammonium nitromolybdate and sulphuric acid there is produced an indigo-blue color. The successive action of chromic acid and sulphuric acid gives a greenish color turning to brown. Treated with sulphuric acid and then with Kœlbrunner's reagent (ferric chloride and potassium ferricyanide) there is an immediate blue precipitate, but with Kœlbrunner's reagent and then with sulphuric acid there is a light blue-green color, gradually becoming blue, but the two effects cannot be confused. In these two reactions terpin hydrate appears to act as a reducing agent. On treating an alcoholic solution of terpin hydrate with sulphuric acid the acid becomes rose-salmon and the alcoholic solution remains colorless. The coloration disappears on agitation unless the solutions are very concentrated. With sulpho nitro-molybdic reagent (solution of ammonium molybdate, 15 per cent., 200; sulphuric acid, 10; nitric acid (36°), 30) the alcoholic solution gives very gradually a blue coloration, becoming indigo-blue in about an hour; in twenty-four hours this becomes blue-green, the intensity depending on the concentration; at the same time there is a white precipitation, probably due to ammonium molybdate, insoluble in the alcohol. The blue coloring matter is soluble in chloroform. Operating in the heat the blue coloration is developed more rapidly, but it disappears very quickly, and in this case the characteristic aromatic odor is perceptible.—Pharm. Journ., Oct. 3, 1908, 434; from Ann. de Chim. Analyt., Sept. 15, 1908, 333.

Resins—Determination of Acid Value.—J. Marcusson and G. Winter-

field, in view of the variation of the acid value of resins according to the conditions under which the neutralization of the acid is performed, insist that in order to obtain definite results it is essential that a specified process should be used, for which purpose they suggest the following: From 3 to 4 Gm. of the finely powdered resin is heated for a short time under a reflux condenser with 200 Cc. of a mixture of equal volumes of benzene and neutral absolute alcohol. When cold, the insoluble matter is filtered out, and the filtrate titrated with $\frac{N}{10}$ alkali to a red tint with phenolphthalein. In this manner the following acid values were obtained: Manila copal, 141.5; mined natural amber, 26.7; worked natural amber, 14.5; mastic, 60.2; sandarac, 137.7; dammar, 24.8; soft elemi, 15.2.—Apoth. Ztg., xxiv (1909), No. 37, 334; from Chem. Rev. d. Fett und Harzind, 1909, No. 5.

Colophony—Delicate Color-Reaction with Halphen's Reagent.—Halphen's reagent for the detection of very small quantities of resin oil in mineral oils, consists of two solutions, as follows: (A) Phenol, 1; carbon tetrachloride, 2. (B) Bromine, 1; carbon tetrachloride, 4. All by volume. This reagent gives a fine violet coloration with resin oil. P. Foerster finds that this test may be applied for the detection of colophony as follows: A few particles of the pulverized resin are treated with 2 Cc. of solution A in a capsule of 25 to 50 Cc. capacity; the sides of the capsules are moistened with the solution by rotating; on bringing solution B in contact with the contents of the capsule a magnificent blue coloration is seen where the vapor of bromine falls. The coloration passes to violet on continuing the treatment. The reaction is extremely delicate, and detects mere traces of colophony. Where colophony is to be sought for as an adulterant it is necessary to isolate it by means of an appropriate solvent, as the reaction may be masked by other organic substances. The method may be used for the detection of rosin as an adulterant in soaps, shellac, jalap resin, etc. In the case of shellac 2 Gms. are finely powdered with sand in a mortar, the powder placed in contact with 10 to 15 Cc. of ether in the cold for five or ten minutes, shaking frequently. The liquid is filtered and evaporated, and the test performed on the residue. With jalap resin 0.2 to 0.5 Gm. is treated with a few Cc. of ligroin; after a few moments contact the liquid is filtered and evaporated, and the test made on the residue. In this way as little as 1 or 2 per cent. of colophony may be detected.—Pharm. Journ., Feb. 13, 1909, 188; from Ann. de Chim. Analyt., Jan. 15, 1909, 14.

Aloe-Wood Oils, etc.—Botanical Origin.—W. G. Boorsma has contributed a work on aloe wood and other scented woods, which is published in the German language, in the "Bulletin du Department de l'Agriculture aux Indes Neerlandaises," and is quoted in abstract in "Schimmel's Report for November, 1908," particularly in so far as the chemical compo-

sition of these woods is of interest in the study of volatile oils. A brief summary of the botanical origin of these woods, habitats of the plants yielding them, their constituents and uses, may prove useful here for further reference. The wood of

Gonystylus Miguelianus, T. et B., sold under the name "kaju garu," is the kind mostly used in Java. It varies in external appearance according to the degree of resinification, and yields on distillation with water about 6 per cent. of an agreeably odorous body, gonystylol, which has been described by Eykm, and to which the wood owes its odor; but the odor emitted during combustion of the wood is due to the resinous constituents of the wood. Another aloe wood, though much less used in Java than that from *Gonystylus*, is derived from a species of

Aquillaria, probably *Aquillaria malaccensis*, Lam.—It is white, particularly soft and light, but when resinified hard and heavy, like gonystylus wood. It yields on distillation with water small quantities of colorless oil, with a faint odor of gonystylol and depositing crystals on standing, which, however, are not identical with gonystylol. The wood yields 40 per cent. of resin to chloroform or alcohol. The wood of a Thymeliaceæ,

Wikstroemia tenuiramis, Mig., a small tree called "tementak" or "menameng," is used on a small scale as a scented wood in Banka. It is much harder than aquillaria wood, and is odorless, but when burnt emits the same odor as the latter. In some parts of the Dutch Indies, the wood of

Excoecaria Agallocha, L., is used under the name "menegen," for fumigating purposes, but only the heartwood of a few old trees burns with an aromatic color. The wood is very soft and light, but when resinified is very hard, red-brown, in places quite black, and completely odorless. It has a bitter taste and yields little on distillation with steam. The wood of

Dolbergia Cumingiana, Benth., known as "kaja laka," is an important scent-wood in the Dutch Indies. It is at first colorless, but in old trees it becomes red and heavier. The aromatic odor emitted when this wood is burnt, originates from an essential oil, colorless, and having a feeble odor reminding of cineol. The wood of a species of

Canarium, known by the native name "kaju resamalia," is imported into Java from New Guinea and the Moluccas *via* Macassar. It is used chiefly for fumigating purposes, giving off a storax-like odor, and contains 0.2 per cent. of an aromatic oil. The wood of

Celtus reticulata, Mig., which is included by the author among the scented wood of Java, because it is employed as a constituent in fumigating mixtures, has an odor which is by no means pleasant, a fact indicated by the native name "kaju tai," meaning "dung wood." Indeed, this wood contains *skatol*, which was detected by Dunstan and by Greshoff,

but this could not be discovered by Boorsma in old wood. Several species of

Coniferæ also contribute to the scented woods of the Dutch Indies. One of these, employed in Macassar under the name of "kayu garu," when examined by Boorsma, showed the usual structure of juniper wood. Another, probably also derived from a *Juniperus*, is known as "kayu kasturi." Finally the author mentions

Alyxia Stellata, R et S, a liana growing in the island of Banka, as furnishing the scented wood called "pulasavi." This contains a resin which on heating showed an aromatic cumin-like odor.—Schimmel's Rep., Nov., 1908, 19–22.

Oleum Anthemidis—Constants of Authentic Distillates.—H. John Henderson contributes an interesting paper on chamomile oil, in which he endeavors to straighten out the confusion arising from the synonymous names of the two distinct plants, *Anthemis nobilis* and *Matricaria chamomilla*, both of which are known as "chamomile." He has examined three samples of oil (*A*, *B* and *C*), distilled from the dried flower-heads of *Anthemis nobilis*, *B. P.*, in the manufacturing laboratory of W. Ransom and Son at Hitchin, one sample (*D*) distilled at Wallingford, Surrey, which is probably distilled from the entire plant, and one other sample (*E*), which was distilled from the entire fresh plant, and was of a smoke-green tint, which the distiller stated to be unusual, the oil being usually blue, the results being shown in the following table:

—	Source.	Sp. Gr.	Acid Number.	Ester Number.	Saponification Number.	$[a]_D$ Room Temp. 13° to 15° C.
A*.	Ransom, 1904	0.9083	7.8	297	305	inactive.
B*.	Ransom, 1908	0.9063	4	313	317	inactive.
C*.	Ransom, 1908	0.9085	4	303	307	inactive.
D..	Wallington Distilled, from Fresh Plants.	0.9088	3.3	280	283	$+\frac{1}{2}°$.
E..	English Distilled Oil from Fresh Plants.	0.9085	2.2	295	297	inactive.

These results show a marked difference from the usual statement in books that Roman chamomile oil is dextro-rotatory, $(a)_D + 1°$ to $+ 3°$ and even $+ 4°$. The author finds that when recently distilled, the oil is soluble in 6 vol. of 70 per cent. alcohol, but this depends on the temperature, sample *a*, for example forming a milky solution at 16.5° C., which

* Dry double flower-heads.

clears up at 30° C. The yield of oil from dried flower-heads (Ransom) was from 0.26 to 0.35 per cent.—Pharm. Journ., Nov. 28, 1908, 683.

Oil of Artemisia Indica (?)—Yield and Properties.—The oil from *Artemisia indica* (?), a composite plant growing wild in the Tengger mountains in East Java, was examined at the Botanical Institute of Buitenzorg. It was obtained in a yield of 0.28 per cent., had a bright brown color and the following constants: Sp. gr. at 26° C., 0.949; opt. rotation at 26° C., +57° 2′; saponification number, 99; ester number, after acetylation, 228, from which a thujyl-alcohol content of 62.7 per cent. was calculated, but, according to Schimmel & Co. corresponds to 75.6 per cent. Thujone could not be detected in the oil, which does not correspond to ordinary wormwood oil. Last year Schimmel & Co. examined two oils from the identical species originating from the same source, one from old the other from younger plants. The oil from the younger plants had a golden yellow color; sp. gr. at 15° C., 0.9573; opt. rotation, + 55° 54′; acid number, 6.7; ester number, 121.6; soluble in 1 vol. and more 80 per cent. alcohol, but opalescent in dilution of 10 vols. The oil from old, plants was brownish-yellow; sp. gr. at 15° C., 0.9595; optical rotation, + 38° 40′; acid number, 5.0; ester number, 138.7; soluble in 1 vol. 80 per cent. alcohol, becoming cloudy with more than 2 vols. Both oils had a peculiar odor resembling camphor, and were useless as substitutes for wormwood oil.—Schimmel's Rep., Nov., 1908, 140.

Oil of Artemisia Arborescens, L.—Yield and Properties.—Schimmel & Co. obtained by distillation from the dried herb of *Artemisia arborescens*, L., 0.62 per cent. of a dark blue oil, similar in odor to the French wormwood oils, which had the following constants: Sp. gr. at 15° C., 0.9458; acid number, 9.8; ester number, 19.5; soluble in about 10 vol. 80 per cent. alcohol, and in every proportion in 90 per cent. alcohol.—Schimmel's Rep., Nov., 1908, 136.

Oil of Artemisia Lavandulaefolia—Examination.—The volatile oil of *Artemisia lavandulaefolia*, a plant growing wild in the Tengger Mountains, Java, has been examined at the Botanical Institute at Buitenzorg. On cooling, the bulk of this oil solidifies, and the crystals separating out in the cooling process appear to possess the molecular formula, $C_{12}H_{14}O_2$, but owing to the lack of sufficient experimental material it was impossible to determine the structure of this compound. The oil has the sp. gr. of 0.924 at 26° C., and the rotation $(a)_D = -7° 32'$.—Schimmel's Report, April, 1909, 20.

Oil of European Wormseed—Composition.—Schimmel & Co. have examined oil of European wormseed (*Artemisia cina*) of their own distillation and find as principal constituents: the hydrocarbons *a-pinene* and *terpinene*, the alcohols *terpineol* and *terpinenol*, and a *sesquiterpene* boiling at about 250° C. The oil had the following constants: Sp. gr. at 15°C.,

0.9271 ; optical rotation, — 5° 2′; index of refraction at 20° C., 1.46664 ; acid number, 7.1 ; ester number, 12.4 ; sapon. number, 19.5 ; ester number after acetylation, 46.4 ; b. p., 160°–300° C. The presence of *terpineol* in this oil has previously been demonstrated by Schindelmeiser (see Proceedings, 1908, 313), but he had found no portions boiling above 230° C. in the oil examined by him.—Schimmel's Rep., Nov., 1908, 68–70.

Oil of Asarum Canadense—Constants of Recent Distillates.—Schimmel & Co. have recently distilled two oils from Canada snakeroot (*Asarum canadense*, L.), which possessed the following constants :

No. 1. From roots with fibers : Sp. gr. at 15° C., 0.9519 ; optical rotation, $(a)_D = -10° 30'$; index of refraction at 20° C., 1.49987 ; acid number, 4.7 ; ester number, 74.7 ; ester number after acetylation, 125.0 ; soluble in 3.4 vols. and more of 70 per cent. alcohol.

No. 2. From roots without fibers : Sp. gr. at 15° C., 0.9520 ; optical rotation, $(a)_D = -10° 42'$; index of refraction at 20° C., 1.48863 ; acid number, 3.1 ; ester number, 86.1 ; ester number after acetylation, 125.8 ; soluble in 2.3 vols. and more of 70 per cent. alcohol.—Schimmel's Rep., April, 1909, 85.

Oil of Cade—Production and Estimation of Authentic Specimens.—C. Pepin has recently published in pamphlet form a very valuable contribution concerning the production and examination of oil of cade, giving in detail the results of researches which were in part communicated several years ago. The results of these researches deserve particular attention since they were made with authentic material, which up to the present time had not been the case. The author gives in the first place a summary of the etymology and history of oil of cade, then, more in detail, the botanical origin and the production of the oil, and finally discusses its properties and tests.

Genuine oil of cade is made exclusively from *Juniperus oxycedrus*, a shrub, often bushy, rarely a small tree, differing from the other juniper species by the simultaneous occurrence of needle-shaped leaves and of fruits, which are orange-red when ripe. It is not cultivated, but occurs abundantly in the wild state, especially in Provence, in a large part of which an abundant distillation-material is available ; but the frequent adulteration of oil of cade has depressed its price to such an extent that the manufacture no longer pays, and is now carried on spasmodically, especially in the departments of Var and Gard in the south of France.

The wood cutters distinguish two kinds of wood, "*Cades gras*," used for the distillation, and "*Cades maigres*," which serves as fuel. In the opinion of the manufacturers, the heart-wood is richest in oil, and the oil-content is said to increase towards the roots. For the purpose of the distillation, the bark is removed, and the wood then cut as small as possible—the method of doing this having an important bearing on the yield

of oil, according to the experience of Pepin, who obtained from shavings 10 per cent. of oil, whereas larger chips yielded much less. The oil is obtained by two methods, the one, "*distillatio per descensum*," employed for its preparation on a small scale, the other, which is universally employed for its manufacture on a large scale, depending on incomplete combustion with exclusion of air (*combustion en milieu confiné*). For this purpose a brick kiln is employed, 18 to 22 feet long and about 6 feet high, with an inclined bottom provided with a gutter which allows the oil to drain into a vessel which is placed in a pit in front of the exit. The kiln is covered with earth, except at the place where the cavity is, and for the purpose of filling it up with wood and setting fire to the latter, large openings are provided on the top and at the sides. Immediately after the fire is lighted all these openings are closed air-tight, after which the distillation with simultaneous carbonization of the wood takes place in the interior. Such a process frequently lasts several days, whereas the first mentioned process, employed for distillations on a small scale, may be ended in from one-half to several hours—this being conducted by enclosing the chips in an inverted cauldron resting on a lid or hollowed-out stone slab having a drain-pipe running off from beneath the latter, and surrounding the cauldron by a fire on all sides. The product obtained by either method is allowed to stand at least 2 or 3 weeks; it has then separated into three layers, of which the upper one is the oil of cade, the lower consists of tarry products, and the intermediate layer is watery.

Using partly his own distillates, partly oils which had been produced under his superintendence, the results of the author's examination lead him to describe oil of cade as being a clear, red-brown, somewhat mobile liquid with a smoky odor, and with a specific gravity slightly below 1, so that drops falling into water soon rise again to the surface. It forms a clear solution with 8 to 10 vol. of 96 per cent. alcohol, is miscible in all proportions with ether, amyl alcohol, chloroform, acetic acid, aniline, and benzene, but only partly soluble in 90 per cent. alcohol, oil of turpentine, petroleum ether and in carbon disulphide. The acid content, calculated as acetic acid, should not exceed 1.5 per cent.—in authentic oils it was determined to be between 0.94 and 1.21 per cent. Distilled at ordinary pressure, cade oil yields a fraction boiling between 150° and 300° C., amounting to from 68 to 80 per cent., whilst pine-tar oil yields only 15 per cent. under the same conditions. The color reactions with ammonia, with lime water, and with ferric chloride are useless, since pine tar gives the same reactions. The furfurol reaction, which has hitherto been regarded as indicative of the presence of adulterants, is also valueless, since the author has definitely demonstrated the presence of furfurol in pure oil of cade. The restriction applies to the detection of pyrocatechol. The "copper acetate test," on the other hand, is available for the detection of pine-tar oil, the petroleum benzin solution of the pure oil of cade

producing with a 5 per cent. solution of neutral copper acetate a chestnut-brown color, whereas pine-tar oil gives an intense green color.—Schimmel's Rep., Nov., 1908, 24–27.

Oil of Cade—New Hydrocarbon Constituent.—N. Lepeschkin has detected another hydrocarbon, $C_{15}H_{24}$, in oil of cade, differing from cadinene and from the known sesquiterpenes by yielding a liquid hydrochloride. After treating the crude material with hydrogen chloride, the new sesquiterpene could be fractionated out from the liquid portion after filtering off the cadinene dihydrochloride which had separated. The preparation had a pale yellow color; b. p., 262°–266° C. at 760 Mm., 135°–140° C. at 20 Mm. pressure; sp. gr., $\frac{20}{4}$° C., 0.9204; index of refraction at 20° C., 1.5159. No crystallized derivatives were obtained.

On the other hand, J. Schindelmeiser is of the opinion that the hydrocarbon $C_{15}H_{24}$ isolated by Lepeschkin was impure, and contained, in addition to the sesquiterpene already described by Tröger and Feldmann (see Proceedings, 1899, 662), also considerable quantities of cadinene. The liquid dihydrochloride remaining after removal of the solid cadinene dihydrochloride, had the constants: b. p., 160°–164° C. at 12 Mm. pressure; sp. gr. at 20° C., 1.114; $(a)_D = +$ 0°. For the sesquiterpene itself, obtained from it, the constants were: b. p., 263°–265° C.; sp. gr. at 20° C., 0.908; index of refraction, 1.5006; $(a)_D = +$ 0°.—Schimmel's Report, Nov., 1908, 27–28; from Journ. Russ. phys. chem. Soc., *40* (1908), 126 and 181.

Oil of Cade—Examination.—Referring commendably to Pepin's paper on the origin, preparation and examination of the oil of cade, Schimmel, & Co., with the object of further clearing up the subject, have procured a guaranteed pure cade oil and subjected it to examination, with the following results: Sp. gr. at 15° C., 1.0309; acid content (calculated as acetic acid), 0.64 per cent.; permanently and clearly soluble in any proportion of chloroform and aniline; soluble also in any proportion in ether, benzene, and glacial acetic acid, but these solutions, clear at first, precipitate after a time. Soluble in an equal volume of 90 or 95 per cent. alcohol, the solution remaining clear on addition of more solvent, but in either case a flocculent separation occurs after some time. Further researches are required to establish really authoritative constants for this empyreumatic oil.—Schimmel's Rep., April, 1909, 58–59.

Oil of Caraway—Adulteration with Castor Oil.—H. John Henderson calls attention to caraway oil recently offered as "Oleum Carui, Ang., B. P., 1898," which contained 16 per cent. of a non-volatile oil, identified as being castor oil. The high specific gravity of castor oil, its low optical activity, and its ready solubility in alcohol, combine to make it an adulterant suitable for bringing up the specific gravity of a decarvolized oil without appreciably affecting its normal characteristics, and from the author's

examination it is evident that this particular oil had been adjusted to meet the requirements of the B. P. and its consequent acceptance unless closely examined.—Pharm. Journ., May 8, 1909, 610.

Oil of Red Cedar Leaves—Yield and Physical Constants.—I. W. Brandel obtained from the leaves of the red cedar (*Thuja plicata*, commonly known as *Thuja gigantea*), 0.8 to 1.14 per cent. of a volatile oil by steam distillation, the larger yield being obtained from leaves of small trees and underbrush. It has a light yellow color and characteristic odor, slightly pungent and camphoraceous, yet fragrant and pleasant, and gave the following constants: Sp, gr. at 25° C., 0.9365; optical rotation. $(a)_D$ at 25° C. = —6°9′; acid number, 0.518; saponification number, 5.7; acetylation number, 6.2; soluble in all proportions in 70 per cent. alcohol. The oil is comparatively free from terpenes, and consists mainly of a ketone, which has been identified to be fenchone. The residue consists largely of esters of borneol, together with some thujone.—Pharm. Review, Aug., 1908, 248–251.

Oil from the Leaves of Thuja Plicata (Red Cedar)—Yield and Composition from Plants Grown in the South of France.—Schimmel & Co. have distilled an oil from the air-dried leaves of the red cedar (*Thuja plicata*, Lamb. non Don.: *T. gigantea*, Nutt.; *T. menziesii*, Dougl.; *T. douglasii*, Nutt.; *T. lobii*, hort.), planted in the South of France. It was obtained to the amount of 1.32 per cent. was of a pale yellow color, and possessed a strong odor of thujone; sp. gr. at 15° C., 0.9056; optical rotation, $(a)_D = +5° 4′$: index of refraction at 20° C., 1.45721; acid number, 0.8; ester number, 16.9; soluble in about 8 vol. of 70 per cent. alcohol with opalescence only, but formed a clear solutionwith 1.2 vols. or more of 80 per cent. alcohol. The thujone separated from the oil with the aid of semicarbazide proved to be identical with *a*-thujone. Attention is directed to the fact that Blasdale's oil from *Thuja plicata* (see Proceedings, 1908, 251), was also dextrorotatory, while Brandel and Dewey describe their oil as lævorotatory.—Schimmel's Rep., April, 1909, 89.

Seychelles Cinnamon-bark Oils—Constituents and Constants.—According to "Bull. Imp. Inst" (*6*, 1908, 111) a cinnamon-bark oil from the Seychelles, examined at the Imperial Institute, London, had the following properties and composition: Color, pale yellow; odor, cinnamon-like; taste, spicy; sp. gr. at 15° C., 0.943; optical rotation, $(a)_D = -4° 30′$; cinnamic aldehyde content, 21.7 per cent; eugenol content, 8.08 per cent.; incompletely soluble in 12 parts 70 per cent. alcohol; soluble in 1.5 parts 80 per cent. alcohol. Schimmel & Co. have had opportunity to examine four similar bark oils originating from Mahé (Seychelles). One of these had a phenol (eugenol) content of 15 per cent., the other three from 6–8 per cent. They varied in their specific gravities from 0.9464–0.9670 at 15° C.; in their optical rotation, from — 2° 30′ to 5° 10′; aldehyde con-

tent, from 25–35 per cent. Three of the oils were insoluble in 10 vols. 70 per cent. alcohol, one of them being soluble in 0.6 vol. 80 per cent. alcohol and the other two in 1.5 and 4–5 vols. respectively, all three becoming opalescent on addition of more 80 per cent. alcohol. The constituents of the sample having the sp. gr. 0.9670 were determined to consist of: Cinnamic aldehyde (32 per cent.), eugenol, caryophyllene, phellandrene, cymene, and *camphor*. All of these, with the exception of "camphor," are known to be present in Ceylon cinnamon oil which, however, contains other constituents that have not yet been detected in the Seychelles oil. No information regarding the plant yielding the barks from which the latter are obtained is at present available.—Schimmel's Rep., Nov., 1908, 41–43.

In further information regarding Seychelles cinnamon oils, Schimmel & Co. state that the cinnamon trees appear to have been introduced in the Seychelles by an inhabitant of the islands who brought over a number of young plants from Ceylon. No further trouble was taken with these, yet they flourished greatly and finally began to spread luxuriantly throughout the islands. The trees develop and are reproduced quickly, and have hitherto been used merely as fuel. From this it may be surmised that the Seychelles cinnamon tree represents its Ceylon congener in the wild state.—Ibid., April 1909, 33.

Cinnamon Root Oil—Composition.—A. A. Pilgrim has examined the oil obtained from the green root bark of *Cinnamon zeylanicum*, Breyne, by steam distillation, and describes it as a pale yellow liquid with a strong odor of camphor, depositing camphor at the ordinary temperature. Its sp. gr. at 15° C. was 0.99360; its optical rotation, $(a)_D = +50° 2' (?)$. The constituents determined were: pinene, dipentene, phellandrene, cineol, camphor, eugenol, safrol, caryophyllene, and borneol. Schimmel & Co. remark that the separation of camphor from this oil has long been known, and that Holmes (1890) showed the oil also to contain cinnamic aldehyde.—Schimmel's Rep., April, 1909, 35; from Pharm. Weekblad, *46* (1909), 50.

Seychelles Citronella Oil—Yield and Constants.—According to a communication in the Bull. Imper. Inst. (*6*, 1908, 109), Ceylon grass, cultivated in the Seychelles since 1903, yielded 0.39 per cent. of citronella oil, which compares favorably with other citronella oils. The sp. gr. at 15° C. is 0.910, and the optical rotation —12° 49'.—Schimmel's Rep., Nov., 1908, 45.

Citronella Oil—Production of Good Quality in the German Pacific Islands.—Schimmel & Co. note that the experimental cultivation of citronella grass in the German Pacific Islands has been crowned with success, and resulted in the production of oils of good quality, closely approximating to Java oil. According to a recent paper by Professor Preuss, *Andropogon*

nardus (?) is to be more extensively cultivated, as oil is already being distilled from this grass on a large scale. Specimens sent for examination have been found satisfactory, having the following characteristics: sp. gr. at 15° C., 0.8819; optical rotation, $(\alpha)_D = -0° 46'$; index of refraction at 20° C., 1.46278; geraniol and citronellal, together, 85.9 per cent., soluble in 1.3 vols. and more of 80 per cent. alcohol.—Schimmel's Rep., April, 1909, 37.

Citrus Oils—Official Characterization of Pure Products.—Shortly before the recent earthquake the Messina Chamber of Commerce published a series of notes by the official chemists, Drs. Berté and Romeo, on the analysis of a number of citrus oils, according to which the characters of pure oils are as follows:

Oil of Lemon.

Specific gravity at 15° C.	0.856 to 0.861.
Optical rotation in 100 Mm. tube at 20° C.	+ 58° to + 66°.
Initial boiling point	175° C.
Fixed residue	2.0 to 3.5 per cent.
Total aldehydes by Soldaini and Berté's method	6.5 to 7.5 per cent.
Citral by Romeo's method	4.0 to 5.6 per cent.

The latter method consists in titrating the alkali liberated in contact with sodium sulphite in presence of potassium bisulphite.

Oil of Sweet Orange.

Specific gravity at 15° C.	0.847 to 0.852.
Optical rotation in 100 Mm. tube	+ 96° to + 98° at 20° C.
Initial boiling point	176° — 177° C.

The rotation of the first 50 per cent. distillate should be at least 1° 30′ above that of the original oil.

Oil of Bitter Orange.

Specific gravity at 15° C.	0.852 to 0.856.
Optical rotation in 100 Mm. tube	+ 88° to + 96° at 20° C.

If 20 Cc. is distilled and 10 Cc. collected, the rotation of the distillate should be at least 3° C. higher than that of the oil. When distilled under reduced pressure the increase usually amounts to 5° C.

Oil of Mandarin Orange.

Specific gravity at 15° C.	0.854 to 0.858.
Optical rotation in 100 Mm. tube	+ 67° to + 73°.
Initial boiling point	176°–177° C.

The first 50 per cent. distilled should have a rotation at least 3° C. higher than that of the oil itself.

Oil of Bergamot.

Specific gravity at 15° C.	0.880 to 0.887.
Optical rotation	+ 7° to + 25°.
(But usually + 10° to + 20° C.)	
Esters (calculated as linalyl acetate)	33 to 34 per cent.
Initial boiling point	180° C.
Fixed residue	5 to 6 per cent.
Acidity (calculated as acetic acid)	0.15 to 0.20 per cent.

Solubility in alcohol. Nearly all genuine oils are soluble in an equal volume of 80 per cent. alcohol and in half their volume of 90 per cent. alcohol. On fractional distillation the rotation of successive fractions should gradually diminish.—Chem. & Drugg., Jan. 16, 1909, 81.

Sicilian Lemon Oils—Comparative Examination of Samples from Different Districts.—Schimmel & Co. have examined authentic samples of oil of lemon produced in twelve different districts in Sicily, three samples from each obtained towards the end of January, of February and of March, so as to establish possible differences between oils from one particular district, as well as graduated differences between oils from the same source, which might be connected with the degree of ripeness of the fruit. The results are given in a table, which shows, however, that no decisive conclusions can be drawn from them; specific gravity and rotation vary irregularly within certain limits, and are not, for example, specially high in oils from one district and specially low in others. With regard to rotation it may perhaps be said that it is inclined to decrease from January towards March, but this is not shown with sufficient clearness, and is just the reverse, for example, in oils from Syracuse. The oils from Messina have the lowest rotation, those from Taormina and Mascali the highest. The individual values moved within the following limits: Specific gravity at 15° C., 0.8569 to 0.8610; optical rotation, + 56° 50′ to 62° 40′; residue of evaporation, 2.2 to 3.6 per cent.; solubility in 90 per cent. alcohol in the proportion of 1 : 7, with more or less turbidity in all cases, caused by the separation of paraffin- or wax-like masses. *Pinene* was detected in all the thirty-six oils examined, but its content was naturally very low, in some cases barely demonstrable. The citral content moved between 4.3 and 7.2 per cent., chiefly between 5 and 7 per cent., the oils from St. Teresa, Messina and Syracuse being comparatively rich in citral, while those from Mascali, Acicatena and Catania contain comparatively little. It is noteworthy that the March oils almost throughout show the lowest citral content. The values obtained, which were determined under exactly the same conditions, go to show that larger differences occur in lemon oils than has hitherto been generally accepted.—Schimmel's Rep., Nov., 1908, 60–63.

Oil of Lemon—Adulterations Observed since the Earthquake in Sicily. Ernest G. Parry says that, as might be expected, a great deal of adulterated oil of lemon has appeared on the market since the disaster in Sicily.

He has examined a number of such samples, apparently originating in Hamburg and London, which had the following characters:

I. Petroleum as the Adulterant.

Sp. gr.	0.866	0.866	0.868	0.870	0.867
Rotation	+40°	+38°	+41°	+30°	+34°
Refractive index at 20° C.	1.4770	1.4769	1.4780	1.4765	1.4775
Citral	2%	1.9%	2%	1.5%	1.8%
Non-volatile residue	31%	34%	30%	51%	44%

The non-volatile residue was an oil of specific gravity (average) 0.878 and refractive index 1.4825. It was entirely unsaponifiable and optically almost inactive.

II. Castor Oil as Adulterant.

Sp. gr.	0.870	0.869	0.872	0.873
Optical rotation	+52°	+51°	+50°	+49°
Refractive index	1.4770	1.4768	1.4760	1.4775
Citral	2.6%	2.4%	2.3%	2.3%
Fixed Residue	9%	11%	11%	12%

The castor oil was identified by its specific gravity (about 0.960), refractive index (about 1.4800), saponification value (about 185), iodine value (about 80), and its non-miscibility with petroleum ether.

III. Turpentine as Adulterant.

These samples were all of low optical rotation—from + 40° to + 50°, and yielded initial distillates of optical rotation down to + 15° C. They left no abnormal residues, but the general character of the first portions distilled showed that the adulterant was turpentine.

IV. Terpenes as Adulterant.

In these cases the specific gravity was from 0.852 to 0.856, optical rotation + 62° to + 64°, and citral value 1.5 per cent. to 2 per cent.—Chem. Drugg., Jan. 23, 1909, 121.

Oil of Lemon—Importance of Correct Thermometric Observations in Fractionations.—Dr. Fleissig directs attention to the possibility of incorrect reading of the temperature in carrying out the fractionation test for oils of turpentine in oil of lemon according to the method described in the Swiss Pharmacopœia. This simply demands that oil of lemon when subjected to fractional distillation should not yield more than 30 per cent. of distillate at a temperature below 172° C. Dependable results are, however, only obtainable if the entire column of mercury of the thermometer concerned in the operation is surrounded by the vapor of the distilling oil, and this can be accomplished by employing shot thermometers which reach completely into the fractionation flask. In actual experiments, employing a long

thermometer, in which the scale from 55° C. to 200° C., extended above the vapor and outside of the neck of the flask, the temperature indicated in the protruding scale was on the average 168.3° C., when that indicated on a short thermometer inserted alongside, and surrounded by vapor up to 200° C, on the scale, indicated 172°. Under these conditions satisfactory yields of distillate were obtained from authentic specimens of pure oil of lemon, whereas, when the reading was made on the protruding long thermometer scale, the yield at 172° C. was considerably in excess of the prescribed 30 per cent. of distillate. The author gives some practical details which, with a series of tabulated results obtained must be consulted with interest in the original.—Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 5, 61–65.

Oil of Lemon—Microchemical Detection of Oil of Turpentine.—E. M. Chase claims that an admixture of 2 per cent. of oil of turpentine in oil of lemon may be detected by the following microchemical method if the distillation is effected in a Glinski tube, and that 10 to 15 per cent. may be detected even without distillation: Fifty Cc. of the oil is distilled in a Ladenburg three-bulbed flask or through a Glinski three-beaded tube. The first 5 Cc. of distillate is mixed with an equal volume of glacial acetic acid and cooled in a freezing mixture. When cold, 5 Cc. of ethyl nitrite is added, and then 2 Cc. of strong hydrochloric acid added drop by drop. The mixture is left in the freezing mixture for fifteen minutes, then filtered through a Buchner vacuum filter. The crystals are washed with about 50 Cc. of alcohol, 95 per cent. The filtrate is refrozen, by which treatment a further crop of crystals is obtained, which are added to those first obtained, the whole being well washed with strong alcohol. When dry they are redissolved in chloroform, and hot methyl alcohol is added until crystallization starts, when the liquid is cooled. Finally, more methyl alcohol is added and the crystals filtered out. For micro examination they may be mounted in olive oil. Under these conditions the crystals of pinene and limonene nitroso-chlorides are very different in form, the former being flattened plates and the latter prismatic needles. The original paper is illustrated by microphotographs of the crystals.—Pharm. Journ., Nov. 14, 1908, 626; from Journ. Amer. Chem. Soc., *30* (1908), 1475.

Oil of Lemon—Determination of Aldehydes by Means of Hydroxylamine.—Objections having been raised to the process recommended by Walther in 1899 for determining the aldehydes in oil of lemon by their reaction with hydroxylamine (see Proceedings, 1900, 744), A. H. Bennett proposes a slight modification of the process whereby he has overcome these. The analysis is conducted as follows: 20 Cc. of lemon oil are mixed with 20 Cc. of a $\frac{N}{2}$ solution of hydroxylamine hydrochloride in 80 per cent. alcohol, and to the mixture is added about 8 Cc. of $\frac{N}{1}$ alcoholic potash and 20 Cc. of strong alcohol (which is sufficient to procure complete solution when hot). The mixture is boiled gently under a reflux condenser for

half an hour, and then allowed to cool. The condenser is washed down and the contents of the flask diluted with 250 Cc. of water, and neutralized to phenolphthalein. The liquid is then treated with $\frac{N}{2}$ sulphuric acid, using methyl orange as indicator. The number of Cc. of acid required, subtracted from the number used in a blank experiment, in which no lemon oil is present, gives the amount of hydroxylamine which has entered into reaction with the citral, and multiplied by 0.076 gives the weight of citral. When the titration to methyl orange is performed in the usual way with addition of a drop of the indicator to the solution, the end point is not very satisfactory; much sharper results are obtained by making use of drops of a very dilute aqueous solution of methyl orange scattered on a white plate. When drops of the solution which is being titrated are brought into contact with these, the change of color when neutralization is complete is well marked. Applying this process to known materials, and averaging the results obtained with genuine oils, the author thinks that a range of 4 to 5 per cent. of citral will probably be found to include almost all pure essences.—Pharm. Journ., April 3, 1909, 463; from *The Analyst*, January, 1909, 14.

Oil of Sweet Orange—Characters, Adulterants, Etc.—Edwin Dowzard says that two varieties of orange oil occur in commerce, sweet and bitter: the former is the oil principally used, the latter being produced only to a limited extent. It is impossible to distinguish between the two oils, except by their odor and taste. The constants of pure sweet orange oil are as follows: Sp. gr. at 15° C., 0.848 to 0.843; optical rotation, $(a)_D$ at 20° C. $= +95°$ to 98°. The rotation of the first 10 per cent. of distillate should not be lower than that of the original oil. This is quite sufficient for the detection of oil of turpentine, and renders the U. S. P. test, depending on the formation of pinene nitrosochloride, unnecessary. The common adulterants of orange oil are: turpentine oil, lemon oil, terpenes of lemon and orange oils, and alcohol. All lower the rotation except the orange oil terpenes. Resin, which has been used as an adulterant, may be detected by residue determinations, which in normal oil should not exceed from 2 to 4 per cent.—Amer. Journ. Pharm., Oct., 1908, 474–476.

Seychelles Oil of Clove Leaves—Yield and Constants.—Experiments made at the Imperial Institute show that Seychelles oil of clove leaves, which is present to the amount of 4.5 per cent., has the following constants: Sp. gr. at 15° C., 1.0489: optical rotation $= -1° 35'$; eugenol content, 87 per cent.; soluble in 1 and more vol. 70 per cent. alcohol. This description of constants is practically the same as that given by Schimmel & Co. in 1907 (see Proceedings, 1908, 322).—Schimmel's Rep., Nov., 1908, 48.

Oil of Copaiba—Sophistication with Gurjun Oil.—Ernest J. Parry observes that there is at the present time a great deal of so-called essential

oil of copaiba on the market, guaranteed to be "B. P.," which on examination is found to be merely a mixture of oil of African copaiba and gurjun oil, mixed in such proportions as to pass the tests of the British Pharmacopœia. The oil has a specific gravity at 15° C. of 0.902, optical rotation (100 Mm. tube), $-14°30'$, and it is soluble in 95 per cent. alcohol. It consists almost entirely of sesquiterpenes, but yileds a well-marked reaction for gurjun oil: when 10 drops are dissolved in 20 Gms. of glacial acetic acid with 10 drops of nitric acid, a deep violet color results. On fractionation, dextrorotatory fractions are obtained. On saturating an ethereal solution of the oil with dry hydrochloric acid no crystalline compounds are obtainable, but a deep violet-blue liquid compound results. The mixture has evidently been made so as to correspond with the figures given for oil of copaiba under Copaiba in the B. P., that is, an optical rotation of the essential oil of $-28°$ to $-35°$ C., which is for a 200 Mm. column.—Chem. & Drugg., Feb. 13, 1909, 270.

Oil of Dalbergia Cumingiana—Yield and Constants.—According to a report in the "Buitenzorg Yearbook (1906)," published in 1907, 0.5 per cent. of volatile oil was obtained from the wood of *Dalbergia cumingiana*, Benth. It had the specific gravity 0.891 at 26° C.; optical rotation at 26° C. $= -4° 31'$; ester number, 5; and after acetylation, 116. A test for aldehyde gave negative results.—Schimmel's Rep., Nov., 1908, 49.

Oil of Dill Herb—Characters and Constituents.—Schimmel & Co. have distilled a volatile oil from Spanish dill herb which appears to be useful on account of its characteristic odor. It has a green-blue color and is pronouncedly dextrogyre, but on account of its dark color the angle of rotation could not be determined exactly. Its specific gravity at 15° C. was 0.9062; index of refraction at 20° C., 1.49185; soluble in 3.4 volumes of 90 per cent. alcohol. Besides carvone and dill apiol (dillisoapiol?), the hydrocarbons d-a-phellandrene, terpinene, and possibly dipentene or limonene, are contained in the oil.—Schimmel's Rep., Nov., 1908, 49–50.

South African Eucalyptus Oil—Properties.—E. F. Hamm reports the results of an examination of a sample of eucalyptus oil sent from the Transvaal, which shows this oil to be of excellent quality and well suited for medicinal use. The specific gravity at 15.5° C. was 0.9227; the specific rotatory power, $[a]_D = + 3° 33'$. Phellandrene was absent; the cineol content was 83.7 per cent.—Pharm. Journ., Jan. 2, 1909, 4.

Oil of Fennel Herb—Properties.—Schimmel & Co. have examined an oil distilled by Dr. Carthaus in Java from the fennel herb (stalks and leaves of *Fœniculum officinale*), and determined the following constants: Sp. gr. at 15° C., 0.9837; optical rotation, $+ 5° 34'$; solidifying point, 16.2° C.; soluble in 2 or more vols. 90 per cent. alcohol. These constants are very similar to those observed in an oil distilled by Dr. Carthaus from the same material, which solidified at 12.8° C. The high solidi-

fying point of both oils indicates a particularly high anethol content.—Schimmel's Rep., Nov., 1908, 71.

Oil of Fir Cones (Abies pectinata, D. C.)—Borneol a Constituent.—While working up a large parcel of oil from the cones of *Abies pectinata*, D. C., Schimmel & Co. were able to prove definitely the presence of borneol in this oil, which possessed the following constants: Sp. gr. at 15° C., 0.8556; optical rotation, $(\alpha)_D = -76° 30'$; index of refraction at 20° C., 1.47246; ester number, 5.3.—Schimmel's Report, April, 1909, 80.

Geranium Oil—Properties of a Japanese Andropogon Distillate.—Schimmel & Co. have received from Dr. de Jong an oil obtained from an *Adropogon* species cultivated in the Botanical Gardens of Buitenzorg, Java, which resembled palmarosa oil in its appearance and odor, but had a very much lower geraniol content. Its sp. gr. at 15° C. was 0.9411; optical rotation, — 3° 16′; acid number, 1.9; ester number, 24.9; ester number after acetylation, 144.5, corresponding to 44.6 per cent. total geraniol; soluble in 2.3 vols. 70 per cent. alcohol, becoming cloudy on further addition, even when 90 per cent. alcohol is added for the dilution; but when rectified with steam, it was found soluble in 1.7 or more vol. 70 per cent. alcohol.—Schimmel's Rep., Nov., 1908, 72.

Oil of Geranium—Dimethyl Sulphide in Réunion and African Oil.—The presence of dimethyl sulphide $(CH_3)_2S$, in American oil of peppermint was noted quite a number of years ago (see Proceedings, 1897, 643), and Schimmel & Co. gave details as to the reactions for the determination of the compound. Recently they have succeeded in detecting the presence of this body in Réunion, as well as in African, oil of geranium. It was discovered in the first runnings of fractionating Réunion oil, the fraction passing between 30° and 60° C., possessing in a marked degree the unpleasant odor of dimethyl sulphide. By repeated fractionation of this fraction, pure dimethyl sulphide, b. p. 37° C., was isolated, and identified by the well-known reactions with mercuric chloride, and and with platinic chloride. In a similar manner, dimethyl sulphide was determined in African oil of geranium.—Schimmel's Rep., April, 1909, 55.

Oil of "Female Hemp"—Yield and Properties.—Frank Rabak obtained 0.04 per cent. of volatile oil by distillation from the staminate *Cannabis sativa*, L., commonly known as "female hemp," and also as "barren hemp". The oil was of a greenish-yellow color and very disagreeable odor or stench, with which the taste conformed also. The quantity obtained was too small for the determination of physical or chemical constants. The material was collected in South Dakota.—Midl. Drug. and Pharm. Rev., Feb., 1909, 6.

Kobushi Oil—Examination of a Distillate from the Japanese Province of Shizuoka.—Y. Asahina and H. Nakamura have examined a kobushi oil

distilled in the Japanese province of Schizuoka from one-year-old twigs, which showed in some respects considerable difference from the kobushi oils so far examined (see Proceedings, 1908, 330). This oil was bright yellow, and had an odor reminding of citral: sp. gr. at 15° C., 0.892; optical rotation, $(a)_D = +60° 8'$; acid number, 4.3; saponification number, 19.1; saponification number, after acetylation, 56.48; soluble in 1.4 vol. of 85 per cent. alcohol, becoming opalescent on further addition. It contained, besides citral (6 to 7 per cent.), eugenol and cineol, methylchavicol, which yielded homo-anisic acid (m. p. 84° to 85° C.), and anisic acid (m. p. 184° C.), when oxidized with potassium permanganate. The oil possibly also contains pinene. Caprisoic and oleic acids were also found. The absence of anethol, which has been found in the kobushi oils previously examined by Charabot and Lalone, and by Schimmel & Co., is noteworthy. Other differences are that the oil is lighter, and, opposite to the others, dextrorotatory, and that it contains eugenol and the two last mentioned acids, which are new features in kobushi oil.

Oil of Lantana Odorata, L.—*Yield and Properties.*—Schimmel & Co. have examined an oil, received from the Department of Agriculture, which was distilled from the leaves of *Lantana odorata*, L., a shrub which grows wild in Jamaica and the West Indies in general, whose aromatic leaves are employed in colds, catarrhs, indigestion, etc., in form of infusion. The yield of oil amounted to 0.16 per cent. calculated on leaves dried at 100° C. It had a lemon-yellow color, an odor like hyssop, reminding at the same time somewhat of ambergris, and had the following constants; Sp. gr. at 15° C., 0.9149; optical rotation—1° 36'; index of refraction at 20° C., 1.49630: ester number, 4.7, and after acetylation, 51.0; soluble in 6 to 7 and more vol. 90 per cent. alcohol.—Schimmel's Rep., Nov., 1908, 140.

Oleum Lavandulæ, Phar. Neerland—Difficulty to Comply with the Official Requirement.—Visser criticizes the characterization of lavender oil in the Dutch Pharmacopœia and gives the results of the examination of commercial specimens as well as of specimens of oils of his own distillation which clearly point out the difficulty of complying with the official requirement of specific gravity and of linalyl acetate content. The results obtained are exhibited in the following:

	Specific Gravity.	Linalyl acetate.	Optical Rotation.
1	0.907	24.3 per cent.	—3.6°
2	0.920	23.6 per cent.	—4.5°
3	0.900	38.9 per cent.	—13.5°
4	—	26.8 per cent.	—
5	0.880	35.0 per cent.	—9.5°

The first three numbers represent commercial specimens; Nos. 4 and 5 oils of the author's own distillation. The Ol. Lavandulæ, Phar. Neerl.,

should have the sp. gr. 0.880–0.890 and should contain at least 35 per cent. of linalyl acetate.—Pharm. Ztg., liii (1908), No. 89,879; from Pharm. Weekbl., 1908, No. 40.

Oil of Lavender—Adulteration with Cocos-Ester.—In the course of an investigation of a specimen of lavender oil, T. Delphin recognized among the products of saponification a foreign acid, which on closer examination proved to be a fatty acid. The sample being soluble in 2.6 vol. of 70 per cent. alcohol, and leaving a residue of only 4.8 per cent. on evaporation in the water-bath, the presence of fixed oils containing glycerin was excluded. Further investigation proved the acids found to resemble those of cocoanut oil, from which it was conjectured that the adulterant consisted of the so-called cocos-ester, and this was subsequently confirmed by comparison of the acids found with those obtained directly from cocos-ester. This ester, it appears, lends itself admirably to the "improvement" of inferior sorts of lavender oil, since it has a very high saponification number—three times as high as lavender oil—and the addition of a comparatively small quantity of the adulterant serves to raise the ester number of the inferior sample. The oil of lavender under examination conformed in all other respects to the ordinary requirements and might have passed muster as true oil of lavender.—Pharm. Ztg, liii (1908), No. 99, 984; from Svensk. farm. tidscrift, 1908, No. 22.

Lemongrass Oils — Distinction between the West Indian and East Indian Oils.—Lemon-grass oil, commonly known as *oil of verbena*, obtained from *Cymbopogon citratus*, is known to vary in its solubility in alcohol. It appears from the statements made by Watt and Tempany that the West Indian oil is objected to on account of its imperfect solubility in alcohol. When first distilled it is miscible with 95 per cent. alcohol up to one and a half times the volume of oil, but a further addition of oil causes turbidity. It has been found that, immediately upon distillation, West Indian lemongrass oil is completely soluble in 95 per cent. alcohol without turbidity, but in a few days it loses this property, and will not give clear mixtures if the volume of alcohol is increased beyond about twice the volume of oil. This is now considered to be probably due to the polymerization of some hydrocarbon, possibly myrcene. The Indian oil of the grass, *Cymbopogon flexuosus*, cultivated on the East Indian coast near Cochin, does not possess this drawback, the oil being completely soluble in alcohol, and having a higher citral content than the West Indian oil. This grass is now under cultivation in the Leeward Islands at the botanic stations, so that in course of time a soluble oil may be produced in the West Indies if the price obtainable, which is very low at present, encourages the cultivation of the grass.—Pharm. Journ., Dec. 26, 1908, 840; from West Ind. Bull., ix, 265.

Lemongrass Oil—Content in the Individual Parts of the Plant.—The oil-content of the individual parts of *Andropogon citratus* in their various

stages of development has been the subject of researches by A. W. K. de Jong (as with patchouli oil, which see), so as to ascertain which period is the most favorable one for the harvest and distillation. He finds the leaves to contain the most of the oil, of which the quantity is always comparatively largest in the leaf of the latest formation, whilst with the increasing age of the leaf, the oil-content continuously diminishes. On the other hand, the citral content of the oil increases slightly as the age of the leaf increases—from 77 to 79 per cent. in the youngest, up to 83 per cent. in the oldest leaves. The stalks of the leaves also contain oil, but considerably less than the leaves themselves. Volatile oil is also present in the bulbs, but not in the thin, fibrous roots of the plant, the young bulbs containing more (about 0.5 per cent.) than the old ones (about 0.35 per cent.). While the author recommends the inclusion of the bulbous roots, therefore, in the distillation, he unfortunately fails to give information as to the properties of the root oil. As to the harvesting period, de Jong concludes that it is inadvisable to wait longer with the cutting than until 4 to 5 leaves have formed. Furthermore, the author finds the solubility of the oil to be very imperfect. Although the Java oil immediately after its production makes a clear solution with 2 parts 70 per cent. alcohol, the solubility diminishes considerably after a few days, and after a prolonged time only forms a cloudy solution. He attributes this change to the polymerization of a terpene; an exudation process being out of the question, since the change occurs also when air is excluded.—Schimmel's Rep., Nov., 1908, 81, 82; from a reprint from "Teysmannia," 1908, No. 8.

In a similar direction, distillation experiments have been carried out at one of the agriculture-chemical experimental stations in Cochin China. It was found that the content of oil during the dry season is considerably larger than during the rainy season, and that the portion of the leaf equal to one-third its length measured from the tip, is much more aromatic than the other two-thirds. Leaves distilled immediately after the harvest yielded in the rainy season 2 per cent., and in the dry season 5.5 per cent. of oil. From thoroughly dried leaves which had lost 70 per cent. of their original weight, 8 to 8.5 per cent. of oil was obtained.—Ibid., p. 82; from Bull. de la Chambre d'Agricult. de Cochinchine, *11* (1908), No. 98, 218.

Lemongrass Oil—Estimation of Citral-Content.—In a previous "Report" (April, 1907) Schimmel & Co. had pointed out that neutral sodium sulphite reacts solely with the citral in lemongrass oil, but that the bisulphite also reacts with the other aldehydes present, and further with a part of the methylheptone. They have since determined experimentally that the difference in the results obtained by the two methods vary between 2 and 5.5 per cent., the published table showing a difference of 2 per cent. and 3 per cent. each in one oil, 3 per cent. in two oils, 5 per cent. in four oils and 5.5 per cent. in two oils, the ten oils showing a total con-

tent (by the neutral sulphite method) varying from 67 per cent. to 85.5 cent. While it does not matter for practical purposes which of the two methods is employed, in comparative examinations only one and the same method should be used, and so stated, since lemongrass oil is generally purchased on the basis of a definite citral content.—Schimmel's Rep., Nov., 1908, 83.

Linaloe Oil—Methyl Heptonal a Constituent.—Schimmel & Co. have detected *methyl heptonal* in a fraction of linaloe oil under examination, the presence of which in nature has not heretofore been observed. The determination of the constants and the elementary analysis confirmed that the alcohol was methyl heptonal, $C_8H_{16}O$. Oxidation with chromic acid in glacial acetic acid resulted in the production of *methyl heptenone*. This ketone was identified by its semicarbazone, having the m. p. 135°–136° C.—Schimmel's Rep., Nov., 1908, 85.

Oil of Lovage Root—Yield and Constants.—Schimmel & Co. have distilled the oil from first year's growth lovage roots cultivated at Miltitz, and from second year's lovage roots cultivated in Thuringia, which showed the following constants:

	Yield.	Sp. gr. at 15° C.	Optical rotation.	Index of refraction.	Acid number.	Ester number.	Ester number after acetyl.	Sol. in 80 per cent. alcohol.
Fresh Miltitz root, 1st year	0.22%	1.0310	+1° 30′	1.55148	5.8	223.5	—	2 vols. and more
Fresh Thuringian root, 2d year.	0.55%	1.0326	+0° 46′	1.54944	6.1	224.5	227.8	2.5 vols. and more

The slight increase only in the saponification number after acetylation leads to the inference that, besides the esterified alcohol, no free alcohol is present in these oils.—Schimmel's Rep., April, 1909, 69–70.

Matico Oil.—Yield and characters as obtained from different kinds of *Matico Leaves*, which see under "Materia Medica."

Oil of Mesua Fenea, L.—*Properties and Uses.*—David Hooper mentions that the oil of the seeds of *Mesua fenea*, L., a tree known in India as "ironwood," or "Nagkesar," is used in Assam, South India and Ceylon as an external application to sores, and as an embrocation in rheumatism. The seeds yield to ether 41.6 per cent. of fixed oil, the kernels alone giving 72.9 per cent. The oil is deep yellow or brown, very bitter, and deposits white crystalline fats at ordinary temperatures.

Three samples from Assam had the following constants:

Specific gravity at 50° C.	0.9359	9.6331	0.9166
Melting point	26.5°	26.7°	16.5°
Acid value	105.6	115.0	38.4
Saponification value	203.7	205.8	205.3
Iodine value	87.0	89.1	87.4
Reichert-Meissl value	11.5	9.8	7.7
Fatty acids, per cent	92.2	93.2	94.1
Melting point	34°	34.5°	33.5°

The solid fatty acids consist largely of stearic acid. The high acidity and Reichert-Meissl values are noticeable.—Pharm. Journ., Aug. 8, 1908, 161.

Oils of Monarda Didyma, L.— Yields and Properties from Flowers and from Stalks and Leaves.—Schimmel & Co. describe two oils distilled during the past summer from different parts of *Monarda didyma*, L.—the one exclusively from the half-faded flowers, the other only from the almost dry stalks and leaves of the plant. The flowers yielded 0.32 per cent. of a pale yellow oil, rich in paraffin and therefore difficultly soluble, which had the following constants: Sp. gr. at 15° C., 0.8665; optical rotation, — 7° 30′; index of refraction at 20° C., 1.46892; acid number, 2.4; ester number, 4.4; soluble in about 20 vols. and more 70 per cent. alcohol, with separation of paraffin. The stalks and leaves yielded only 0.096 per cent. of oil to steam distillation. This was lemon-yellow and gave the following constants: Sp. gr. at 15° C., 0.8855; optical rotation, — 32° 38′; index of refraction at 20° C., 1.46892: acid number, 5. 5; ester number, 20.4; soluble in 2 vols. and more 70 per cent. alcohol, but the dilute solution becomes cloudy owing to separation of paraffin. The odor of both oils was almost identical and lavender-like.—Schimmel's Rep., Nov., 1908, 86.

Java Nutmeg Oils— Yield and Constants.—From 839 Gm. of fresh Java nutmegs, de Jong obtained 31.7 Cc. of oil by distillation, having the sp. gr. of 0.940 at 26° C., and the optical rotation + 10° 20′ at 26° C. From 202 Gm. of fresh nutmeg blossoms, 15.3 Cc. of oil were obtained, having the sp. gr. at 26° C. of 0.942, and the optical rotation at 26° C. of + 7°. —Schimmel's Rep., Nov., 1908, 89; from "Teysmannia," 1907, No. 8.

Oil of Ocimum Viride— Yield and Properties.—E. Goulding and R. G. Pelly have distilled from the leaves of the mosquito plant (*Ocimum viride*), sent in March, 1907, from Sierra Leon to the Imperial Institute, 0.35 per cent. of an orange-yellow volatile oil, having an aromatic thyme-like odor and a spicy pungent taste, and the following constants: Sp. gr. at 15° C., 0.9115; optical rotation, about + 1° 30′; soluble in every proportion of 90 per cent. alcohol. The oil contained approximately 32 per cent. thymol, 40 per cent. alcohols (calculated as $C_{10}H_{18}O$), 2 per cent. esters (calculated as $C_{10}H_{17}OCOCH_3$), and a terpene or a mixture of terpenes having a high refractive power and a lemon-like odor. Leaves obtained in September from Northern Nigeria yielded 1.2 per cent. of volatile oil

according to an examination made at the Imperial Institute.—Schimmel's Rep., Nov., 1908, 89–90; from Proc. Chem. Soc., *24* (1908), 63.

Cyprus Origanum Oil—Botanical Origin and Properties.—L. L. Pickles publishes the results of a detailed examination of cyprus origanum oil, the botanical origin of which is still doubtful. While the plant yielding it has by different authors been referred to *Origanum onites*, *O. dubium*, *O. majorana* and *O. majoranoides*, the physical constants of the oil and its content of carvacrol correspond more to those of an oil from *Origanum hirtum*, Lk. The oil examined had a gold-brown color, a pleasant thyme-like odor and a burning taste; it rapidly darkened under the influence of air, and showed the following constants: sp. gr. $\frac{15}{15}$, 0.967; optical rotation, + 0° 12′; soluble in 1 vol. and more 80 per cent. alcohol. Aldehydes, ketones or esters were not detected, and acids only in traces—*isobutyric acid* judging from the odor. It contained 84 per cent. of phenols, and of these *carvacrol* formed by far the bulk. From the oil from which the phenols had been removed, a fraction (2.5 per cent. of the oil) with a lemon odor was obtained, which the author regards as a new terpene, and has called *Origanene*. It has the sp. gr. at 16° C., 0.847; optical rotation, + 1° 50′; index of refraction, 1.480.—Schimmel's Rep., Nov. 1908, 90–92; from Journ. Chem. Soc., *93* (1908), 862.

Orris Oil—Constituents Detected in the Cohobation Waters.—Schimmel & Co. detected the following compounds in the cohobation waters from the orris oil distillation by methods of fractionation briefly described: *Acetaldehyde*, in a fraction boiling at 51° to 57° C; *Methyl alcohol*, in a fraction boiling at 66° to 67° C., from which dimethyl oxalate was prepared in long needles of the m. p. 54° C.; *Diacetyl* was detected in a fraction distilling at 57° to 67° C., by the osazone of the m. p. 242° C.; and *Furfurol*, in a golden-yellow heavy oil, b. p. 160° to 161° C., which separated off when the last portions of the cohobation waters were fractionated, and which with a solution of aniline hydrochloride in aniline gave the characteristic color-reaction. The semicarbazone, difficultly soluble in alcohol, and crystallizing in brilliant prisms, showed the melting point of the furfurol derivative, 197° C.—Schimmel's Rep., Nov., 1908, 94.

French Parsley Oil—Presence of a New Phenolic Ether.—In the course of experiments undertaken for the purpose of determining whether climatic or other conditions of cultivation had any influence on the formation of myristicin, which was found in considerable quantity in French parsley oil with traces only of apiol, while the latter was contained in large quantities in German parsley oil, H. Thoms discovered in the French oil, by fractional distillation, the presence of a new phenolic ether, which from analysis and an examination of its optical properties appears to be 1 allyl 2 : 3 : 4 : 5-tetramethoxybenzene III.; the substance crystallizes from aqueous alcohol, on cooling in a freezing mixture, in colorless plates

which melt at 25° C.—Pharm. Journ., Oct. 24, 1908, 516; from Berichte, *41* (1908), 2753–2761.

Oil of Pastinaca Fruits—Constituents.—The oil from the fruit of pastinaca herb consists chiefly of the esters of octyl alcohol. Among the acids liberated by the saponification of these esters, van Renesse (1875) recognized *butyric acid* and an acid of lower carbon content, possibly *propionic acid*, while the chemists of H. Hänsel, in 1907, detected *heptylic acid*. Schimmel & Co., making up a mixture of acids from several kilos of pastinaca oil, have succeeded in isolating among other acids considerable quantities of *caproic acid*. The pastinaca oil, of their own distillation, had the sp. gr. at 15° C., 0.877; saponification number, 229. The caproic acid had the sp. gr. 0.934, and the boiling point 204° to 206° C.—Schimmel's Rep., Nov., 1908, 94.

Patchouli Oil—Content in Different Parts and During Various Stages of Development of the Plant.—With the view of improving the methods of harvesting and distilling plants containing volatile oils, which operations have hitherto been carried on in the tropics in a more or less haphazard way, A. W. K. de Jong, of Buitenzorg, Java, has undertaken studies regarding the oil content of the plants during the various stages of development, in order to ascertain which is the most favorable period for the harvest. For this purpose, comparative distillations (with water) were made with material which had reached different stages of development; for example, of the leaves, all the first, second, third, fourth, etc., pairs of leaves, reckoned from the extreme point of the twig, were distilled separately, and, in addition, the leaves were classified according to their weight and number. Other parts of the plant were also tested for their oil content. Up to the present, the author has in this way studied lemongrass (which see) and patchouli, selecting for the latter examination the Singapore variety (*Pogostemon tomentosus*, Harsk?). He has established that the oil is formed chiefly in the three first pairs of leaves, *i. e.*, in those which have developed most recently, but then remains constant although the leaf still increases considerably in weight, and that the rotary power of the oil is practically unaffected by the age of the leaves. The leaves, stalks and the roots were also examined for their oil content. In the former it is extremely low, in the roots a little higher, and the root oil was specifically heavier than water—consequently of a different composition from the leaf oil.

On the strength of his experiments the author concludes that it is advantageous to cut the plants when they have five (5) pairs of leaves, and to reject the stalks and roots in the distillation. Furthermore, it is said that the oil of the fresh leaves is useless. In order to improve the odor, the Singapore leaves are mixed with Java dilem leaves, and they should also be submitted to a fermentation; but on these points further information

is promised.—Schimmel's Rep., Nov., 1908, 95–97; from a Reprint of the Author's Paper.

Oil of European Pennyroyal—Adulteration with Eucalyptus Oil.—Schimmel & Co. call attention to an adulteration of oil of European pennyroyal (*Mentha pulegium*, L.) with eucalyptus oil. Two oils adulterated in this manner were suspicious chiefly on account of their low pulegone content, 25 per cent. and 30 per cent. respectively, as against 80 per cent. in normal oils. The specific gravity was also lower. The adulterant was recognized by fractional distillation, pure oil of European pennyroyal yielding only about 5 per cent. of distillate up to 210° C., whereas the corresponding fractions of the two adulterated oils amounted to about 45 per cent. and consisted to the amount of about one-third of *cineol*, which is not a natural constituent of the normal oil. The adulterant does not reveal itself by the odor. Heretofore the only adulterant detected has been oil of turpentine.—Schimmel's Rep., Nov., 1908, 67–68.

Oil of Peppermint—Possibility of Error with the U. S. P. Assay Process.—Inasmuch as oil of peppermint is a solution of about 40 to 45 per cent. of menthol in menthyl acetate and other liquid constituents of the oil, it is evident that after elimination of a certain quantity of the latter a separation of menthol crystals will occur. Dr. Gunar Heikel, in calling attention to this, mentions that such an elimination takes place when the oil is saponified, as is directed in the first step of the official (U. S. P.) process of assay, and that by washing the saponified oil, previous to acetylation, considerable loss of menthol is occasioned, the crystals being carried away with the wash-water. In an actual experience, an oil containing 9.2 per per cent. of menthyl ester (as acetate) and 51.6 per cent. of total menthol, when assayed according to the U. S. P. method, showed only 19.0 per cent. of total menthol; and while this is possibly an extreme case, some loss of menthol appears to be inevitable. The author therefore suggests that the oil be acetylated before saponification. The saponification may then be made and the menthol determination carried out as usual, the result giving the total menthol, irrespective of the amount present originally in the free state.—Amer. Journ. Pharm., Aug., 1908, 373–374.

Javanese Oil of Peppermint—Properties.—Schimmel & Co. describe a distillate sent to them last year by Dr. Carthaus from Java as peppermint oil. This was pale yellow, and had a peculiar odor, not in the least reminding of peppermint oil. It contained about 55 per cent. of a compound reacting with neutral sodium sulphite, which is probably identical with *pulegone*, while the portions which did not enter into reaction with sodium sulphite had a pronounced linalool odor. The following constants were determined: Sp. gr. at 15 C., 0.9792; optical rotation, +11°15′; acid number, 0.7; ester number, 19.0; ester number after acetylation, 45.6; soluble in 1.8 and more vol., 70 per cent. alcohol.—Schimmel's Rep., Nov., 1908, 102.

Italian Oil of Peppermint—Properties of a Distillate from Cultivated Mitcham Plants.—Schimmel & Co. describe the properties of an oil recently received, which was distilled from Mitcham peppermint plants cultivated in Italy. It was characterized by a good aroma and had the following constants: Sp. gr. at 15° C., 0.9090; optical rotation, $-21°12'$; index of refraction at 20° C., 1.46248; acid number, 0.5; ester number, 11.8; corresponding to 3.85 per cent. ester menthol; ester number after acetylation, 159.5; corresponding to 50.5 per cent. total menthol; menthone content, 17.2 per cent.; soluble in 3.5 and more vol., 70 per cent. alcohol. This oil differs from the Italian peppermint oils examined several years ago (see Proceedings, 1903, 911), by a lower specific gravity, a higher optical rotation, and by a distinctly larger content of menthone, of which the previous oils only contained a little over 8 per cent.—differing in this also from the Mitcham oil produced in England, to which it is otherwise closely allied in its properties.—Schimmel's Rep., Nov., 1908, 100.

Hungarian Spearmint Oil—High Carvone Content.—Schimmel & Co. have examined spearmint oils from Hungary, which are said to have been distilled from the dried herb. Their composition proved to be similar to that of the German and American distillates, but they differ from them in their higher carvone content, which runs up to 72 per cent. as against about 50 per cent. in German and American oils. Corresponding with their greater carvone content the specific gravity of the Hungarian oils, (0.936 to 0.94 at 15° C.), was also in many cases higher than that of the other varieties, and their greater solubility (in 1 vol. and more of 80 per cent. alcohol), also attracted attention, since the German and American oils give opalescent solutions, becoming turbid when more solvent is added. —Schimmel's Rep., April, 1909, 85.

Oil of Mentha Arvensis, var. Glabrata—Yield and Properties.—Frank Rabak obtained by distillation of the fresh herb of *mentha arvensis*, var. *glabrata*, found growing rather luxuriously in scattered patches, in South Dakota, a pale yellow oil in a yield of 0.8 per cent. The odor of this oil closely resembled peppermint, in taste extremely minty and pungent; sp. gr., 0.9277; optical rotation, $(\alpha)_D = +16° 27'$; soluble in ½ vol. 90 per cent. alcohol; acid value, 2.6; ester number after saponification, 13.1. corresponding to 4.6 per cent. of ester if calculated as $C_{10}H_{19}OCOCH_3$; ester value after saponification, acetylization, and again saponifying, was 47, which, calculated as $C_{10}H_{19}OH$, represents 13.57 per cent. alcohol. A negative test was obtained for aldehydes with fuchsine and with Nessler's reagent.—Midl. Drugg. and Pharm. Rev., Feb., 1909, 5.

Poco Oil ("*Poco olie*")—*Botanical Origin.*—The reference to poco oil (poco olie) in the "Buitenzorg Annual Report" (1906), induced Schimmel & Co. to ask Dr. M. Greshoff, Director of the Colonial Museum, Haar-

lem, for further details with regard to the botanical origin of this oil. In response, Dr. Greshoff states that "poco olie" (*Minyak poko*, or *Minyak poho*), may be translated somewhat like peppermint oil, and that the plant yielding it is, according to Bauer, *Mentha aquatica*, L., in Chinese "Loeng noo poho." It is imported from China into Java, where it is a popular remedy for headache, and is also employed in cholera. A genuine poco oil sent to the Buitenzorg Botanical Institute had the sp. gr. at 26° C. of 0.909, and the optical rotation at 26° C. = —42° 20′.—Schimmel's Rep., Nov., 1908, 85.

"*Oleum Pini Silvestris*."—*Misapplication of the Term to "Templin Oil*."—Schimmel & Co. point out that the designation, "*Oleum pini silvestris*," which is frequently applied to oil from fir cones (templin oil, *Oleum templini*) is quite a misnomer, and gives rise to constant confusion. They emphasize that, although the oil from the needles of the common pine (*Pinus silvestris*, L.), has often been distilled on an experimental scale, it has never been manufactured on a large scale, since, owing to its somewhat disagreeable odor, it has never acquired popularity, and consequently plays no part at all as a commercial article. But the constant confusion of this oil with the oil from fir cones (*Abies pectinata*, D. C.) has been the cause why genuine oil from pine needles, notwithstanding that it is unobtainable commercially, has been incorporated into several pharmacopœias. To reiterate, the article which goes by the name of *Oleum pini silvestris* in commerce is really oil from cones of *Abies pectinata*, D. C.—Schimmel's Rep., April, 1909, 79.

Oil of Poplar Buds—Constants.—Schimmel & Co. have during the last few years had opportunity to examine two samples of oil of poplar buds, which are rarely produced, and determined the following constants, respectively: sp. gr. at 15° C., 0.8957 and 0.8991; optical rotation, +5° 45′, and +5° 16; acid number, 2.8 and 6.4; ester number, 8.2 and 8.9. The first sample was soluble in 3.5 to 4 vol., 95 per cent. alcohol; the second required about 10 vol. 95 per cent. alcohol for solution, gave the ester number, 32.5 after acetylation, and showed the index of refraction at 20° C., 1.49582. Noteworthy differences from constants previously observed are a slightly lower sp. gr. in both samples, and the inferior solubility of one of them, while the acetylation made with the second oil gives evidence of a poor content in alcohol.—Schimmel's Rep., Nov., 1908, 103.

Oil of Rose—Conditions Determining its Satisfactory Production.—Marpmann, discussing the progress modernly made in the industrial production of oil of rose, lays down the following cardinal rules:

1. The blossoms are to be collected when the odor is fully developed and the oil is present in maximum quantity. This is attained by collecting only fully expanded roses before sunrise, in the dew, and immediately immersing them in water. The volatile oil in the blossoms increases in

quantity under water at certain temperature, and the yield is markedly greater than if the roses are gathered after sunrise and then immediately distilled.

2. On the small industrial scale, the roses must be preserved by salting them. This is done by tearing up the fresh flowers, pressing them with alternate layers of salt into barrels, using about 1 lb of salt to 3 lbs. of rose-petals, and covering the surface with boards weighed with stones, so that the petals may be covered with the brine produced. The oil distilled from these "salted" rose petals is fully as fine as that distilled from the fresh flowers.

3. While on the small scale the ordinary methods of distillation are resorted to, on the large industrial scale the product may be improved by the aid of vacuum distillation or by the extraction of the flowers with benzin, ether, etc. Unfortunately, with the use of solvents usually employed, the oil is liable to acquire a more or less unpleasant by-flavor, derived from the solvent or extracted from the flowers themselves, which is subsequently removed only with difficulty. The author, however, looks forward with some confidence to the availability for this purpose of pure hydrocarbons of the aliphatic methane series, such, for instance, as *heptane* (normal C_7H_{16}), or *heptine* (C_7H_{12}), or normal *nonane* (C_9H_{20}), all of which are absolutely odorless and may be removed from the oil with practical completeness. It is true, the high price of these hydrocarbons makes their use for this purpose prohibitive at present; but with the demand for them in industrial quantities, they will doubtless be cheapened sufficiently to permit their profitable application to the direct extraction of oil of rose from the flowers.—Pharm. Zentralh., xlix (1908), No. 34, 571.

Otto of Rose—Method of Production and Yield in Bulgaria.—"An importer" writes interestingly about the production of otto of rose as conducted up to the present time in Bulgaria. He says truly essential oil of rose is distilled in other countries, but Bulgaria is unique in the open-air process, which has prevailed there for many years, and remains the same to-day as far as the bulk supply is concerned. Of late years a steam distillery turns out annually a small quantity, which, however, is of a more greenish color than that produced by the old method. The open-air stills are invariably set up in a corner of a field, or in the immediate vicinity of the rose trees. The Bulgarian farmer believes much in getting the flowers as soon as possible into the still after the gathering of the same, and collects the blooms about an hour before sunrise, in order that the sun's rays may not rob him of the very volatile essential oil by evaporation, which is readily set up under the powerful rays of the Eastern morning sun, and at the time of "rose harvest," men, women and children all help to collect the flowers as speedily as possible just at the proper time. About 40 pounds of the flowers are put into a still with some 60 pounds of water, the mass is well mixed, and gentle heat is applied; when, after four

or five hours, about one-third will have come over, and this is then reworked with another 40 pounds of fresh flowers and subjected to the same process as before. The distillate is then poured off into porous earthenware vessels and exposed to the air; the otto being carefully freed from any impurities, it is put into bottles for market, or more frequently ready to be priced and handed over to those who have previously bargained with the farmer for his growing crop, a matter of no little difficulty, and one which sometimes takes weeks of arguing to settle. The damask and musk rose (*Rosa centifolia* and *R. sempervirens*) are those mostly grown, although a large white variety has of late been found to yield a very fine, pale oil. It is said that 100 pounds of rose petals scarcely yield half an ounce of the otto.—Pharm. Journ., Oct. 24, 1908, 573.

Oil of White Bulgarian Roses—Inferiority to Oil from Red Roses.—In a report on an oil from white Bulgarian roses, Rouse-Bertrand Fils states that the odor of this oil is much less delicate and persistent than that of the oil from red roses, and therefore advises that the latter only should be used for distilling purposes. The oil in question possessed the following constants: Sp. gr. at 15° C., 0.8723; optical rotation, $(\alpha)_D = -2° 54'$; ester number, 11.14; ester number after acetylation, 222.44, corresponding to 74.44 per cent. of alcohols of the formula $C_{10}H_{20}O$; soluble, with marked separation of paraffin, in 1 vol. 90 per cent. alcohol; solid at 14° C., but liquifies at 20° C.—Schimmel's Rep., April, 1909, 81.

Dalmatian Oil of Sage—Constituents and Characters.—T. F. Harvey, after reviewing the results of the examinations of oils of sage of different origin—Dalmatian, Syrian and Spanish—and from identified species (*Salvia officinalis*, *S. triloba*, and *S. sclavea*), which are exhibited in tables accompanying his paper, concludes that Dalmatian oil of sage may be taken as the type of ordinary sage oil, and its characters as so far recorded are:

Specific Gravity	0.915 to 0.930.
Rotation	+ 4° to + 25°.
Solubility in 80 per cent. Alcohol	1 vol. and more.
Acid Value	1.3 to 2.2.
Ester Value	6.7 to 12.6.
Saponification Value	6 to 18.
Borneol (total)	9.5 to 14.8.
n_D 20° C.	1.4618 to 1.4645.
Distils chiefly	170° to 220° C.

The normal constituents of Dalmatian sage oil are stated to be pinene, cineol, thujone, borneol, and possibly camphor. The respective boiling points of these substances are 155°–156° C. (pinene), 176°–177° C. (cineol), 203° C. (thujone), 212° C. (borneol), 204° C. (camphor). It is evident that important differences in the constituents and characters of oil of sage from different countries occur. While Dalmatian oil is referred

to *Salvia officinalis* and Syrian oil to *Salvia triloba*, the Spanish oils are different in character, and may be derived from a different species of *Salvia*.—Chem. and *D*rugg., Sept. 5, 1908, 393.

Oil of Muscatel Sage—Variations in Different Year's Product.—In a recent report of Rouse-Bertrand Fils (1906) two oils of muscatel sage, distilled in different years, are described, which showed considerable difference from the constants given for this oil by Gildermeister and Hoffmann, and differed considerably from one another, although the plants from which they were distilled were grown in the same district and had been gathered under the same conditions. Schimmel & Co. have also observed during the last few years in their distillates from plants, partly of their own cultivation, that the properties of muscatel sage are subject to very considerable, and in any case much wider fluctuations than those given in the above-mentioned work. This is explained by the fact that Gildermeister and Hoffmann's figures are based on very scarce examination-material. The data recently observed by Schimmel & Co. were as follows: Sp. gr. at 15° C., 0.92 to 0.96, and, in one case, even to 0.98; optical rotation, +30° to —45°; index of deflection at 20° C., 1.48 to 1.51; acid number, 18.2 to 153.0; ester number after acetylation, 87.8 to 155; soluble in 1 vol. 90 per cent. alcohol, but becomes opalescent if more solvent is added, owing to separation of paraffin. Apart from the state of vegetation, it is a matter of importance whether the whole plant is distilled, or only parts thereof—inflorescence or only herbaceous parts, and whether the fresh or dried material is worked up. The oil richest in ester and alcohol being obtained when working up the fresh herb. The preparation of the material for distillation and the method of distillation are, moreover, of special importance.

In a recent examination of Rouse-Bertrand Fils (1908) they were able to isolate from this oil large quantities of linalool. Schimmel & Co. suggest that muscatel sage oil also contains linalyl acetate, its lavender-like odor rendering this very probable, as mentioned in their report for October, 1894 (see Proceedings, 1895, 1034).—Schimmel's Rep., Nov., 1908, 87–88.

Oil of Sandal Wood is the subject of a paper by A. R. L. Dohme and H. Engelhardt, in rejoinder of a criticism on their previous publications on the same subject by Mr. E. L. Parry and by Schimmel & Co. in the "Proceedings" of this Association, 1908, 811–814.

Oil of East African Sandalwood—Yield and Properties.—Schimmel & Co. have obtained by steam distillation from a so-called East African sandalwood, sent to them from Lyons, 4.86 per cent. of a bright brown oil whose odor reminded somewhat of vetiver oil and also of gurjun balsam, but differed totally from that of East India sandalwood oil. The new oil had the following constants: Sp. gr. at 15° C., 0.9477; optical

rotation, —42° 50′; index of refraction at 20° C., 1.52191: ester number 11.1; ester number after acetylation, 72.8, indicating a content of 30.5 per cent. of a sesquiterpene alcohol, calculated for $C_{15}H_{26}O$; soluble, with comparative difficulty in 7 to 8 vol. 90 per cent. alcohol. The botanical origin of the wood was determined by Prof. Voight, Director of the Botanical Museum, Hamburg, to be a species of *Osyris*, probably *O. tenuifolia*, N. O. santalaceae.—Schimmel's Rep., Nov. 1908, 109.

East Indian Sandalwood Oil—Important Constants for Identification.—After giving a comprehensive review of the history of East Indian sandalwood oil and of its chemical investigation, Dr. Kurt Bode declares that genuiness and good quality of a sample of oil is absolutely determined if it responds to the following four constants collectively: Specific gravity at 15° C., 0.975–0.985; $(a)_D$ = — 16° to — 21° C.; santalol (calculated as $C_{15}H_{24}O$), at least 91 per cent.; solubility in three to five or more vols. of 70 per cent. alcohol at 20° C. A higher rotation, a lower specific gravity, and a more difficult solubility, would indicate an addition of oil of cedarwood or oil of gurjun balsam, while oil of copaiba is indicated by lowering the optical rotation. The surest guarantee of quality, however, is the santalol determination, which may be carried out by any one without much difficulty. With regard to color reactions, which are frequently mentioned, the author regards them as absolutely worthless, and they should therefore not be taken into consideration for identity determinations.

In view of recent observations conflicting with the above views regarding the four constants, mentioned by Dohme and Engelhardt, W. J. Bush & Co., and others (see Proceedings, 1908, 339–342), the author recommends for the present great caution before arriving at a conclusion, lest otherwise inferior East Indian oils may be admitted on the market; but since in all the recent observations assurance is given that the examined oils were actually distilled from good East Indian sandalwood, the variations observed are probably due to failure to conduct the distillation under normal conditions.—Apoth. Ztg., xxiv (1909), No. 2, 17–19.

Sassafras Oil—Camphor a Constituent.—Referring to a statement in a paper on the adulteration of volatile oils by C. R. Pancoast and W. A. Pearson (see Proceedings, 1908, 308–309), that sassafras oil contains no camphor, and that its presence indicates adulteration with camphor oil, Schimmel & Co. point out the error of this statement, inasmuch as the presence of camphor has been demonstrated with absolute certainty in 1896 in their New York laboratory by Power and Kleber (see Proceedings, 1896, 745), in sassafras oil of their own distillation. The camphor was determined both qualitatively (oxime, m. p., 115° C.), and quantitatively (6.8 per cent).—Schimmel's Rep., Nov., 1908, 113.

Oil of Savin—Characteristic Odor the Best Qualitative Test.—A.

Beythein and P. Atenstädt find that none of the few tests which have been described as being characteristic of savin oil can be relied upon. The only test which appears to be of some service consists in heating 2 Cc. of the oil with 0.5 Cc. of solution of stannous chloride in a boiling water-bath for a short time, whereby the oily layer becomes brown or red-brown, and the stannous chloride solution yellow; but similar colorations are given by the oils of juniper and of turpentine. The authors conclude that the characteristic odor of oil of savin constitutes its best qualitative test.—Pharm. Journ., April 2, 1909, 463; from Ztschr. f. Untersuch. d. Nahr.-u. Genussm., *16* (1908), 677–679.

Oil of Sium Cicutæfolium, Gmel.—Yield and Character.—A quantity of "hemlock water parsnip" (*Sium cicutæfolium*, Gmel.), collected in South Dakota, was distilled by Frank Rabak in August, 1905, yielding 0.5 per cent. of a bright yellow volatile oil. The odor strongly suggested caraway accompanied by a decided terebinthinate flavor. The taste was more or less pleasant, sweetish, and fatty with an absence of pungency; sp. gr. at 22° C., 0.8447; optical rotation $(a)_D = +63° 40'$; soluble with turbidity in 6 vols. or more of 90 per cent. alcohol; acid number, 0; ester number 33; ester number after acetylation, 33, indicating an ester content of 11.55 per cent. if calculated as $C_{10}H_{17}OCOCH_3$. The strong dextro-rotation probably indicates the presence of d-limonene. A pronounced reaction for aldehyde was obtained by the fuchsine test and also with silver nitrate solution.—Midl. Drugg. and Pharm. Rev., Feb., 1909, 5.

Oil of Tagetes Patula, L.—*Yield and Properties.*—From the fresh umbels with the involucre of *Tagetes patula*, L., a plant indigenous to Mexico, but cultivated in European gardens, Schimmel & Co. obtained by distillation, in a yield of 0.1 per cent., a golden yellow volatile oil, having a powerful odor, which reminds somewhat of fruit esters and of olefinic tinctures. It appears to resinify very readily and gave the following constants: Sp. gr. at 15° C., 0.8856; optical rotation, $-5° 35'$; index of refraction at 20° C., 1.49714; acid number, 2.0; ester number, 18.7, and after acetylation. 74.3; soluble in 6 or more vol. 90 per cent. alcohol with opalescence. The plant is employed in Mexico as a stimulant, diuretic, and diaphoretic, which promotes menstruation, and is also used against intermittent fever, while in larger doses it acts as an emetic. The flowers were formerly official in Europe under the incorrect name of "Flores africani."—Schimmel's Rep., Nov., 1908, 141.

Ylang-Ylang Oil—Characters and Constants.—Bacon finds that notwithstanding the complex composition of ylang-ylang oil it is not difficult to distinguish a good oil from inferior qualities. The ester number of good oil is 100 or higher, whereas inferior grades rarely show a higher number than 80. The refractive index of fine oils is usually low, rarely exceeding 1.4900 (at 30° C.), whereas that of inferior oils approaches 1.5000. The

optical rotation of fine oils is between —32° and —45°; inferior oils exhibit a rotation of —60° or more. The author expresses the opinion that ylang-ylang oil is rarely adulterated, because only the finer sorts command a profitable price. Incidentally the author mentions that he has been able by his investigation to add to the already numerous constituents of this oil two not heretofore observed, namely, formic acid and safrol.—Pharm. Ztg., liii (1908), No. 91, 900; from The Philippine Journ. of Science, *3*, 65.

Réunion Ylang-Ylang Oil—Constants.—Rouse-Bertrand Fils have ascertained the following values in an ylang-ylang oil from Réunion: Sp. gr. at 15° C., 0.942; opt. rotation, $(a)_D = -30° 8'$; ester content (calculated as linalyl acetate), 33.6 per cent.; total alcohol (calculated as linalool), 40.3 per cent.; soluble in 0.5 to 1 vol. 90 per cent. alcohol, followed by slight cloudiness. These figures agree with those of Manila oil.—Schimmel's Rep., April, 1909, 94.

Ylang-Ylang Oil—Production in the Philippines.—Raymond F. Bacon gives some interesting information concerning the production of ylang-ylang oil in the Philippines, which has increased enormously in recent years, the output having increased from 10917 kilo. in 1904, for example, to 27030 in 1907. Two grades of oil are produced, "bests" and "seconds"—350 lbs. of flowers yielding one kilo of the first-class and, in addition, 0.75 kilo of the second quality, the latter being also much cheaper. Much mystery surrounds the distillation of the first grade of oil, but in Mr. Bacon's experience the only points requiring special attention are that the distillation be conducted slowly, with clean steam, and that no more than 1 kilo of oil be collected from 400 kilos of flowers. Any further oil obtained should be kept separate and sold as second class. The distillation apparatus should be lined with block tin or nickel throughout. The examination by Mr. Baker of twenty-three samples of first-grade oil and sixteen samples of the second-grade product resulted as follows:

—	First grade Oil (13 samples).	Second-grade Oil (16 samples).
Specific gravity (30–34° C.)	0.827 to 0.949	0.896 to 0.940
Optical rotation	$[a]_D$ –26° to –49.7	–27.7 to –87.0
Refractive index (at 30° C. for D. line)	1.4747 to 1.4940	1.4938 to 1.5082
Ester number	95 to 129.7	49 to 94

These results all indicate that an oil with a low refractive index, low rotation, and high ester number is certain to be good. Distillation experiments conducted *in vacuo* showed that of a first-grade oil 50 per cent.

will pass over below 100° C. under 10 Mm. pressure. The common adulterants of Philippine ylang-ylang oil are said to be alcohol, turpentine oil, cocoanut and other fixed oils. Mr. Bacon, however, does not believe that sophistification is commonly practised. The author also studied the proximate composition of ylang-ylang oil, and has added two new constituents to those already known—viz., safrol and formic acid, the latter being present as an ester.—Chem. & Drugg., April 3, 1909, 534; from Philipp. Journ. Sc., 1908, *3*, 64.

Alcohols and Derivatives.

Primary Alcohols.—Action of *metallic oxides* upon them, which see under "Inorganic Chemistry."

Alcohol Percentage Table.—A. B. Lyons has worked out an alcohol table to facilitate rapid approximate determinations of alcohol by apparent specific gravity, which will unquestionably prove very useful to pharmacists operating under the provisions of the Food and Drug Act. This voluminous table is printed in the "Proceedings" of the Association, 1908, 906–930.

Alcohol Estimation—Influence of Glycerin, Acetanilide, etc.—In order to determine the question whether or not the presence of glycerin, acetanilide and certain other substances in pharmaceutical preparations would interfere with the accuracy of the estimation of alcohol, L. E. Warren and H. C. Fuller, of the Drug Division, Bureau of Chemistry, have made a series of experiments, which are communicated as part of a Report on Medicinal Plants and Drugs to the Association of Official Agricultural Chemists, 1908, by L. F. Kebler, Referee. The results of these investigations, which are exhibited in the form of a table, have shown that none of the substances experimented with, namely, glycerin, acetanilide, antipyrine, and mixtures of these with caffeine, sodium and potassium bromides and sugar, interfere with or exert any marked vitiating influence in the determination of alcohol in pharmaceutical preparations by the usual method of distillation.—Amer. Journ. Pharm., Feb., 1909, 66–72.

Alcohol—Production from Cellulose Substances.—The problem of the production of alcohol from cellulose substances has been the subject of study by Körner, the material employed for his investigation consisting of sawdust, sulfit-cellulose and straw. From 100 Gm. of dry wood about 6 Gm. of alcohol were obtained, while the largest yield was obtained from sulfit-cellulose, namely 12.83 Gm. from 100 Gm. of material used. The author considers this increased yield to be due to the higher cellulose content of the sulfit-cellulose, wood containing only about 50 per cent. of cellulose, and he regards it as positive evidence that the sugar is derived from cellulose and not from the lignin contained in the wood. The addition of oxidizing agents to promote the conversion of cellulose into fer-

mentable sugar has in most cases the contrary effect; but a marked increase is obtained by the addition of hydrogen dioxide, wood yielding with such addition up to 50 per cent. more of alcohol than could be expected under ordinary conditions. The results lead to the conclusion that weak oxidizing agents cause the conversion of the cellulose into a compound more susceptible to the formation of sugar, and from the fact that the highest yield of alcohol (17.95 per cent.) was obtained with hydrocellulose, it becomes evident that the cellulose is converted into hydrocellulose by the action of the hydrogen dioxide. It becomes apparent also that the effect of more energetic oxidizing agents, such as potassium dichromate, potassium persulphate and ozone, consists in the production of higher oxidation products which do not lend themselves to the production of fermentable sugar. It is furthermore apparent from the present investigation that even the most favorable yield of alcohol is far below the theoretical yield—56.91 Gm. alcohol from 100 Gm. cellulose. The author therefore regards it probable that only a portion of the cellulose complex ($C_6H_{10}O_5$) is split off and becomes available for conversion into fermentable sugar.—Pharm. Ztg., liii (1908), No. 99, 980; from Ztschr. f. angew. Chem., 1908, No. 46.

Denatured Alcohol—Review of Technical Work and Scientific Investigation.—The German Treasury Department has published a comprehensive report on the technical and scientific work done from October, 1905, to September, 1907, on the subject of denatured alcohol, such as the progress made in cheapening the production of alcohol from such material as wood, peat, coal (acetylene); the methods and material for its denaturation, with consideration of its uses in the arts, in the preparation of chemicals, as a fuel, etc.; the possibility of evasion of properly imposed duty, such as rendering it suitable for the purposes of beverage, or the manufacture of certain preparations entering into competition with those ordinarily prepared from tax-paid alcohol, etc., etc. An interesting review of this report will be found in Pharm. Ztg, liii (1908), No. 71, 995–996.

Jamaica Rum—Distinction of Genuine and Artificial.—Real Jamaica rum contains certain aromatic bodies which do not occur in European potable spirits nor in fictitious rum. R. Micko finds that if 200 Cc. of the spirit and 30 Cc. of water are distilled into seven fractions, each of 25 Cc., the first two or three fractions will contain alcohol and the esters of formic and acetic acids. The fractions following will have a characteristic odor when the rum is artificial. With genuine Jamaica rum the typical aroma occurs in the fifth and sixth fractions. Not only can a trained sense of smell and taste differentiate between genuine and spurious rum by this test, but can even detect a mixture of one with the other.—Pharm. Journ., Feb. 13, 1909, 188; from Chem. Techn. Report, *32* (1908), 675.

Ether—Water-Solubility Test.—W. B. Cowie and T. O. Broadbent,

among other tests to determine the quality of pure ether (sp. gr., 0.720, B. P.), mention that the water-solubility test when carried out with distilled water previously saturated with ether, gives excellent results. They recommend it particularly for the busy pharmacist, as it enables him to obtain a fair idea of his ether in a single test.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 465.

Aether Bromatus, G. P.—Unsatisfactory Commercial Quality.—Dr. O. Schweissinger calls attention to the frequent unsatisfactory quality of the ethyl bromide (aether bromatus, G. P.) of the market, which often is decidedly acid, and on spontaneous evaporation in a capsule leaves an unpleasant, garlicky odor. He attributes this to the fact that such ethyl bromide is prepared by the interaction of phosphorus bromide and alcohol, whereas the G. P. directs its preparation by reaction between nascent hydrobromic acid and alcohol, a mixture of alcohol, sulphuric acid and potassium bromide being subjected to distillation. He suggests that the G. P. should include the following additional requirement: If 3 Cc. aether bromatus are evaporated in a small capsule, an unpleasant, garlicky odor should not manifest itself during the evaporation nor in the residue. Under existing definitions, purchasers should designate not "aether bromatus, D. A.-B., IV," but "aether bromatus prepared by the method of the D. A.-B., IV."—Pharm. Zentralh., xlix (1908), No. 46, 931–932.

Monobromaldehyde—Preparation by the Action of Bromine on Ether.—Ch. Manguin finds that when a mixture of bromine, water and ether is exposed to light, it is decolorized, the action being very rapid in sunlight. When the reaction is completed, two layers are formed; the lower aqueous layer contains hydrobromic acid, the upper layer an aldehyde which yields a white crystalline solid with urethane, melting at 106° C. This solid is the condensation product of monobromaldehyde with urethane, and with 10 per cent. sulphuric acid yields monobromaldehyde in aqueous solution. —Chem. News, Dec. 4, 1908, 280; from Compt. rend., *147* (1908), No. 17.

Chloroform — Electrolytic Production from Calcium Chloride. — A method for the production of chloroform by electrolytic action is described in "L'Electricien" (*36* [1908], 44), as follows: To a solution of 50 p. of hydrated calcium chloride in 100 p. of water, alcohol is added in the proportion of 6 Gm. per liter. The mixture is heated to 58°–63° C., and an electric current of 3–4 volts tension and 4 amperes is passed through it. Chloroform distils over and is collected in alcohol. The calcium chloride may also be replaced by alkali chlorides.—Pharm. Ztg., liv (1909), No. 19, 187.

Iodoform—Production by the Intervention of Carbon Dioxide.—Since Sérulas (1882) first prepared iodoform, it has been found that a large number of organic bodies are capable of producing this compound, when

they are treated with iodine in the presence of alkali. Guérin has now determined that an entire additional series of organic bodies is capable of producing iodoform if iodine is caused to act upon them in the presence of ammonia and fixed alkali, and that under these conditions even carbon dioxide may produce iodoform. The method is as follows: To a solution of 5–6 Gm. of potassium iodide and 2–3 Gm. of alkali carbonate in 50 Cc. of water, 10 Cc. of ammonia and 10 Cc. of solution of KOH are added, followed by solution of hypochlorite in small portions at a time. This causes the formation of dark flakes of nitrogen iodide, which disappear on shaking, being converted by the simultaneously formed and very unstable hypoiodite into iodoform. After several additions of hypochlorite, the nitrogen iodide disappears only very slowly; if then ammonia is added in large excess and the mixture is shaken, iodoform is instantly formed. The reaction is explained by the author according to the following formula:

$$KI + KClO = KCl + KIO.$$

$$NH_3.NI_3 + 2KIO + K_2CO_3 + 2NH_3 = CHI_3 + 2KI + 2KOH + 4N + 3H_2O.$$

In place of a hypochlorite a solution of iod-potassium iodide may be employed to act upon the mixture of ammonia, caustic alkali and alkali carbonate with equally satisfactory results, the reaction leading to the formation of iodoform being regarded by the author to be essentially identical with the above.—Pharm. Ztg., liv (1909), No. 7, 66; from Journ. de Pharm. et Chim., 1909, No. 2.

Iodoform—Assay in Gauzes, Lint, Etc.—E. H. Gane and M. H. Wheeler describe the following processes, with which they have had considerable experience in the assay of iodoform in commercial samples, as well as in checking the declared percentages of iodoform in gauzes, cottons, etc. The first of these, which may be termed the nitrous acid process, was suggested by Utz in 1903 (see Proceedings 1904, 895); the second is a saponification process.

Process I.—Dissolve 0.5 Gm. iodoform in 10 Cc. of a mixture of 1 part ether, 3 parts alcohol; add 50 Cc. $\frac{N}{10}$ silver nitrate and 1 Cc. fuming nitric acid (commercial nitrous acid, sp. gr. 1.42). Warm on a steam-bath till the odor of nitrous acid has disappeared, then add 100 Cc. distilled water, 1 Cc. saturated solution ferric alum, and titrate excess of silver nitrate with $\frac{N}{10}$ potassium sulphocyanate. Each Cc. of $\frac{N}{10}$ silver nitrate consumed corresponds to 0.0130 Gm. iodoform.

Process II.—In a flask fitted with a reflux condenser place 0.5 Gm. iodoform, 30 Cc. absolute alcohol and 5 Gm. potassium hydroxide, and boil gently for two hours. At the end of that time cool, add 50 Cc. water, sufficient nitric acid to render slightly acid, and 50 Cc. $\frac{N}{10}$ silver nitrate, followed by 1 Cc. saturated solution ferric alum. Excess of silver nitrate is then estimated by $\frac{N}{10}$ potassium sulphocyanate as above.

Gauze, lint and similar substances are exhausted by ether in a Soxhlet apparatus and the ethereal solution treated in the ordinary way. As a routine process, the authors favor the nitrous acid process, owing to the ease and rapidity with which it can be carried out.—Merck's Rep., Jan., 1909, 13; from Drug Topics.

Silicium Iodoform—Preparation and Properties.—Silicium iodoform, $SiHI_3$, has been recently obtained by passing a current of hydriodic acid and hydrogen peroxide over silicium heated to redness. O. Ruff finds that it may be obtained in much larger yield by the following method: A benzol solution of silicium chloroform is treated with aniline, and the silicohydrotrianilide, $SiH(NH.C_6H_5)_3$, so formed is split up by means of anhydrous hydriodic acid. Silicium iodoform is a colorless liquid which solidifies at 8° C., and decomposes at above 150° C. It may, however, be distilled without decomposition, under reduced pressure. It is very sensitive to the action of moisture, which occasions the formation of silicoformic acid, SiH_2O_2.—Pharm. Journ., Dec. 19, 1908, 804; from Berichte, *41* (1908), 3738.

Absolute Methyl Alcohol—Preparation.—Joseph Gyr obtained absolute methyl alcohol from acetone-free methyl alcohol by boiling for some time with freshly-burnt lime and then leaving it in contact with ignited potassium carbonate for several days, or even weeks; the resulting liquid was then gently heated over a water-bath with freshly made turnings of metallic calcium until most of the metal had been acted on, and was finally distilled, care being taken to exclude all moisture during distillation by means of calcium chloride tubes. The action of the alcohol on the metal is at first slow, but as the amount of water is diminished the reaction becomes increasingly violent, and if the temperature is allowed to rise much it may become almost explosive. Absolute methyl alcohol is not quite odorless, but it has not the empyreumatic smell of ordinary methyl alcohol. It boils at 64.56° C. under 760 Mm. pressure, and has specific gravity 0.79647.—Pharm. Journ., Feb. 27, 1909, 273; from Berichte, *41* (1908), 4322.

Methyl Alcohol—Detection of Minute Quantities in Ethyl Alcohol.—According to Hinkel very small quantities of methyl alcohol may be detected in ethyl alcohol as follows: To 1 Cc. of the suspected alcohol, in a small flask, add 0.8 Gm. of ammonium persulphate and 3 Cc. of diluted sulphuric acid (1:5), dilute the mixture with 20 Cc. of water, distill with a naked flame and collect five consecutive portions of 2 Cc. each in test-tubes. The first two portions contain only acetaldehyde; the three following are tested for formaldehyde, the oxidation product of methyl alcohol, by adding a few drops of a ½ per cent. solution of morphine hydrochloride and then pouring concentrated sulphuric acid along the inner wall of the test-tube so as to form a substratum. In the presence of formaldehyde, even when largely diluted, a violet ring is formed at the zone of contact of the

two layers, while acetaldehyde produces an orange color under the same conditions.—Pharm. Ztg., liv (1909), No. 11, 106; from The Analyst, *33*, 417.

Wood Alcohol—Chloroform a By-Product of its Purification.—In the purification of wood alcohol the separation of acetone by fractionation is attended with much difficulty because the boiling points of methyl alcohol and of acetone are very close to each other. Taking advantage of the ready convertibility of acetone into chloroform by treatment with neutral or alkaline hypochlorides, while methyl alcohol is not affected, Chute has devised a method for the separation of acetone and allied bodies from crude wood alcohol, which is protected by U. S. patent No. 893,784. After the conversion of the associated acetone into chloroform, the boiling point of the methyl alcohol is raised by the addition of water or of soluble or hygroscopic salts (preferably calcium chloride), whereupon the chloroform may be easily and completely distilled off at its boiling point (60° C.) without carrying over any methyl alcohol, which afterwards is distilled over at a higher temperature, and when rectified by redistillation is entirely free from acetone or acetone-like contaminants.—Pharm. Ztg., liii (1908), No. 72, 702; from Chem. Ztg., 1908, No. 68, Rep.

Formaldehyde—Reaction with Ammonium Sulphide.—F. Todtenhaupt finds that on adding a dilute solution of ammonium sulphide, a turbidity occurs, which, on further addition, increases; gradually, a fine white precipitate separates. The turbidity reaches a limit on addition of formaldehyde. The supernatant liquid remains clear, and no longer smells of the sulphide. On adding strong solution of formaldehyde to strong solution of ammonium sulphide, there separates, after a few moments, and on strongly heating, a viscid, glassy, white mass which may be drawn out into threads. On allowing to cool, or pouring off the supernatant liquid, and treating the mass with cold water, the ductile mass hardens, and a glassy white resinous-like body, with a glistening fracture is obtained. By kneading in the hands it will assume any desired form. The melting point is about 45° C. Heated for some time at a little over 100° C., and then cooled, it is a transparent, vitreous mass. It is insoluble in water, diluted aqueous solutions of alkalies and acids, alcohol, carbon disulphide, benzene, and acetic ether, but easily soluble in chloroform and hot glacial acetic acid. By evaporation of the chloroformic solution there remains a sticky mass, which later becomes hard. From a solution in boiling glacial acetic acid, acicular crystals separate on cooling, which melt, after recrystallization, at 208° C. The mass possesses the property, in the molten state, of dissolving sulphur, and is then colored yellow to brown, according to the quantity of dissolved sulphur.—Pharm. Journ., Nov. 14, 1908, 626; from Chem. Ztg., Oct. 24, 1908, 1045.

Esters of Thiophosphoric Acid—Formation and Properties.—Pistschi-

muka obtains the methyl and ethyl esters of thiophosphoric acid—$PS(OCH_3)_3$ and $PS(OC_2H_5)_3$—by the action of phosphorus sulphochloride on solution of sodium alcoholate in methyl and ethyl alcohol, respectively. They form colorless solutions which cannot be distilled under ordinary pressure without decomposition. Under a pressure of 20 Mm., however, the former boils at 82° C., the latter at 106° C. They possess in a high degree the power of forming compounds with mercuric chloride, ferric chloride, etc. The specific gravity of the methyl ester is 1.2192; it is insoluble in water, and has an odor reminding of ozone. It fumes in the air, and on mixing with alcohol.—Pharm. Journ., Dec. 19, 1908, 804; from Ber. d. D. Chem. Ges., *41* (1908), 3854.

Crotonic Aldehyde—Preparation by the Action of Sulphuric Acid on Aldehyde and Paraldehyde.—Marcel Delépine finds that when aldehyde vapor is led into an excess of concentrated sulphuric acid at 10°–15° C., it is absorbed without any signs of charring, and on diluting the liquid with ten parts of water and distilling, large quantities of crotonic aldehyde are obtained. He also finds that when paraldehyde is dissolved in concentrated sulphuric acid, and the liquid is diluted and distilled, crotonic aldehyde passes over in the first portions, but at the same time the polymer of crotonic acid, $C_8H_{12}O_2$, is obtained.—Chem. News, Jan. 15, 1909, 36; from Compt. rend., *147* (1909), No. 24.

Orthovanillic Aldehyde—Production in Crystalline Form.—Tiemann and Roppe have shown that by treating guaiacol with chloroform in the presence of alkali, vanillin, $CHO.C_6H_3.OCH_3.OH$, and an isomeric body, $CHO.C_6H_3.OH.OCH_3$, orthovanillic aldehyde, are formed. The latter has been described as an oily yellow liquid, but Freyss has recently obtained it quite pure in fine bright yellow crystals, melting point 45° to 46° C. To separate it from vanillin the mixture of the two aldehydes is distilled with steam, care being taken to keep the temperature below 115° to 120° C., to avoid distillation of vanillin. The sodium salt of orthovanillin aldehyde is yellow and soluble in water, the bisulphite compound is white, the phenylhydrazone is yellowish-white, melting point 130° to 131° C.; the aldazine occurs in bright yellow needles, melting point 198° to 199° C. Pharm. Journ., Sept. 26, 1908, 402; from Proc. Soc. Indust. Mulhouse (1908), *2*, 24, through Journ. de Pharm. et Chim., 28 (1908), 173.

Ilicic Alcohol—Identity with a-Amyrin.—Personne attributed to ilicic alcohol, which he had separated from birdlime, the formula $C_{25}H_{44}O$; but this is found by E. Jungfleisch and H. Lereux not to be correct, the formula being $C_{30}H_{50}O$. Ilicic alcohol is therefore identical with *a*-amyrin; the melting-point is the same, 181° to 181.5° C. It has the same crystalline form, its esters are similar and have the same boiling points, the benzoates from both sources have the same characteristic dimorphic forms, in long silky needles and large prisms with brilliant facets. The former melt at

170° C., the latter at 192° C. Divers and Kavaketa have isolated two alcohols from Japanese birdlime, from *Ilex integra*, mochylic and ilicylic alcohols, the latter being closely allied to ilicic alcohol, and Mora has found an alcohol in the resin of *Dacroydes hexandra*, which he considers to be identical with the last-named alcohol. The re-examination of these alcohols, with a view to establishing their relationship to the amyrins, would be interesting.—Pharm. Journ., Dec. 26, 1908, 8403 from Compt. rend., *147* (1908), 862.

Glycerin—Acrolein in Combination as Impurity.—G. F. Bergh's investigations concerning an organic impurity in glycerin have led him to make the following statements: (1) The impurity, which communicates the reducing properties to many of the best samples of commercial glycerin, is the unsaturated aldehyde, acrolein. It occurs, however, for the most part, not in the free state, but combined with the glycerin. (2) The compound consists of a molecule each of acrolein and glycerin, and possesses an acetal nature, for which reason the author has given it the name

Glycerin-acrylal. It does not reduce alkaline copper solution, and scarcely affects ammoniacal silver solution. Water decomposes it gradually into its component parts, but the decomposition is much hastened by warming with dilute acid. (3) The glycerin-acrylal has no distinct odor, and as it occurs in glycerin only in minute quantity it cannot be detected by the sense of smell, nor can it be detected by the ammonio-silver test of the German Pharmacopœia. The author recommends for its detection the employment of a sensitive sulphurous acid-fuchsine solution, as the free acid of the reagent decomposes the compound. Alkaline copper solution may also be employed if the acrolein be first set free by carefully warming with diluted sulphuric acid.—Pharm. Journ., Oct. 3, 1908, 434; from Svensk. Farm. Tidskr., *15* (1908), 285–292.

Acid Barium Glycerophosphate—Preparation.—Commenting on the communication of P. A. W. Self (see Proceedings 1908, 355), P. Carré states that it is not possible to obtain pure "acid barium glycerophosphate" by treating the neutral salt with sulphuric acid until neutrality to helianthin is obtained, for he has already shown that by this method the acid glycerophosphate first obtained is partly transformed into the neutral salt and free glycerophosphoric acid.—Pharm. Journ., April 10, 1909, 494; from Bull. Soc. Chim., *5* (1909), 109.

Resorcinol—Dusty-fine Powder.—Under the designation of "Resorcin. sublimat. pulv. subt." a preparation is now obtainable which makes it quite convenient to prepare perfectly smooth resorcinol ointments with anhydrous bases. The preparation is supplied in form of a dusty-fine powder, and responds to all the requirements of pure resorcinol.—Pharm. Ztg., liii (1908), No. 85, 841.

Resorcinol—Cause of Coloration.—Experiments made by Thomas Dun-

lop demonstrate that the spontaneous coloration of resorcinol is due primarily to moisture, whilst the presence of iron is a factor in producing the change. Furthermore, that air, sunshine, and heat all seem to be necessary to promote the change when once it is set up. Instead, therefore, of the present inaccurate statement anent the cause of color and storage, the author suggests that, in a new edition of the B. P. C., the following should be substituted: "Exposed to moist air, it acquires a pinkish tinge. It should, therefore, be kept in a dry place or in well-stoppered bottles."—Pharm. Journ., May 1, 1909, 580.

Resorcinol—New Antiseptic Compounds.—D. Monteil describes, and gives the process for the preparation of, two new resorcinol compounds for which he claims marked antiseptic efficiency, and which he designates respectively as "Resorcinoform" and "Odylis," or terpin resorcinate. The first of these,

Resorcinoform, occurs in the form of a currant-red amorphous powder, with neither odor nor taste. In contact with wounds, it acts by virtue of its elements, resorcinol and formaldehyde. It may easily be prepared by placing 110 Gm. of resorcinol and about 100 Gm. of solution of formaldehyde in a porcelain dish, and dissolving. When solution is complete, it is poured into a sufficient quantity of cold hydrochloric acid. The mixture at once assumes the form of a rose-colored magma, which it is necessary to keep stirred to prevent adhesion to the sides of the containing vessel. It is then filtered, and the precipitate thus collected dried at 25° C.; a stronger heat decomposes it. The second preparation,

Odylis (*Terpin Resorcinate*) is obtained by heating a mixtnre of resorcinol 110 Gm., and terpin hydrate, 190 Gm., in a porcelain capsule on a water-bath at 100° C. The mixture assumes the consistence of an oil, yellowish and very thick, and very fragant. It is of great use as an antiseptic and cicatrisant. Its oily nature renders it miscible with various fatty substances, and thus makes it of use in special cases. It is soluble in alcohol, ether and oils. The oily solution may be administered as an antiseptic in the form of capsules.—Pharm. Journ., May 22, 1909, 697; from L'Union Pharm., April, 1909, 159.

Resorcinol—Formaldehyde a Very Sensitive Reagent.—Observing that bivalent phenols yield with formaldehyde in acid solution resinous condensation products, which are insoluble in all the ordinary solvents, Silbermann and Ozorovitz describe a very delicate reaction of resorcinol, which is based upon this property of formaldehyde. If resorcinol is heated with formaldehyde in the presence of some hydrochloric or sulphuric acid, a voluminous white, flocculent precipitate forms in a short time, which, when added to concentrated sulphuric acid, or heated with strong hydrochloric acid, acquires a fiery carmine-red color. On dilution with water, or neutralization, this color changes to orange; on addition of alkali (in excess?

Rep.) to Bordeaux-red.—Pharm. Ztg., liii (1908), No. 89, 880; from Bull. Soc. de Sciénte d. Bucuresci, 17, 41.

Phenol Estimation.—W. A. Puckner and A. H. Clark communicate the results of their experiments undertaken for the purpose of evolving a satisfactory method for the isolation and estimation in pharmaceutical products, in a paper published in the "Proceedings" of this Association, 1908, 824–830.

Phenol—Red Color a Product of Oxidation.—Gibbs finds that the red color of phenol after prolonged exposure to light, air or moisture is not due to the presence of impurities, as is commonly supposed, but to the oxidation of small quantities of the phenol itself into quinone, pyrocatechin and probably also phenoquinone. The author has succeeded in determining the presence of these bodies in reddish-colored phenol.—Pharm. Ztg., liv (1909), No. 35, 345; from Philipp. Journ. of Science, *3*, 361.

Phenol and Cresotic Acids, their Detection in Salicylic Acid and its Derivatives, is the subject of a paper by H. Engelhardt and H. W. Jones, printed in the "Proceedings" of this Association, 1908, 866–867.

Chlorophenols—Identification Tests.—Deniges utilizes the reactions of the different chlorophenols with formaldehyde for their identification and differentiation. Thus 0.1 Cc. of a 10 per cent. alcoholic solution of the phenol to be tested for is placed in the bottom of a test-tube without moistening the sides, or 0.01 Gm. of the phenol and 0.1 Cc. of 90 to 95 per cent. alcohol; to this is added exactly 2 Cc. of sulphuric acid, specific gravity 1.840, and after thoroughly mixing, 2 drops of commercial solution of formaldehyde dropped from a tube made so as to deliver 40 drops to the Cc. The test-tube is then shaken, and the coloration observed at once. Brown, more or less greenish, rapidly becoming intense = parachlorophenol; intense carmine = orthochlorophenol, and ordinary phenol, but on adding 10 Cc. of alcohol and carefully shaking to mix, the mixture becomes yellowish-brown; this, if turbid = orthochlorophenol, if clear = ordinary phenol. Again, the same quantity of the phenolic compound is placed in a test-tube as already described, 1 Cc. of water and 1 Cc. of sulphuric acid (specific gravity 1.840), exactly measured, are added; after shaking and allowing to cool, 2 drops of formaldehyde are added, and the whole mixed, when a turbidity or white precipitate is observed. If this does not change, even after some time = parachlorophenol; if it rapidly becomes feebly rose-colored = orthochlorophenol; if strongly rose-colored = ordinary phenol. On adding to the contents of the tube, 2 Cc. of 90–95 per cent. alcohol and shaking, a clear liquid = parachlorophenol; the liquid remains turbid = orthochlorophenol and ordinary phenol; on adding 5 Cc. more of alcohol and again shaking, a clear liquid = orthochlorophenol; if a persistent flocculent precipitate be formed = ordinary phenol.—Pharm. Journ., Feb. 27, 1909, 272; from Bull. Soc. de Pharm. de Bord., 1908, 328.

Phenols—Characteristic Reactions with Formaldehyde-Sulphuric Acid.—Pouquet finds that formaldehyde-sulphuric acid, which has been used as a reagent for morphine, yields characteristic color reactions or precipitates with all phenols, among which the following are particularly noteworthy :

Phenol : A rose-red precipitate, darkening by heating.

Pyrocatechin : A white precipitate, turning red on standing and more rapidly on heating.

Hydroquinone : A dirty gray precipitate, changing to brown by heating.

Pyrogallol : An intense wine-red color.

Phloroglucin : A light yellow precipitate, changed to golden-yellow by heat.

Guaiacol : Like pyrocatechin.

Eugenol : A brick-red precipitate, turning black when heated.

Vanillin : A green-yellow color, changing to garnet-red on heating.

β-Naphthol : A rose-red precipitate, the liquid green fluorescent.

Salicylic Acid : A white precipitate.

Acetylsalicylic Acid : A rose-red precipitate.

Tannin : A rose-red precipitate, turning orange on heating.

Thymol : A yellow precipitate, brown-red when heated.

For solids the reagent is applied in separate solutions : I. Formaldehyde, 40 per cent., 20 drops ; water, 10 Cc. II. Sulphuric acid of 66° B. About 2 Mgm. of the solid and 1 Cc. of No. I are mixed and 1 Cc. No. II is added. If the substance is in form of aqueous solution, 1 Cc. of this solution is mixed with 1 Cc. of pure sulphuric acid and 2 drops of 40 per cent. formaldehyde solution. The author suggests that the morphine reaction with this reagent is due to the presence of a phenolhydroxyl in the morphine molecule.—Pharm. Ztg., liv (1909), No. 28, 281 ; from Bull. des Scienc. Pharmacolog., 1909, No. 3.

Aloesol—A New Phenol from Aloes.—At a recent meeting of the Société de Pharmacie, E. Léger announced that he had obtained by the action of hydrochloric acid and potassium chlorate on Cape and Uganda aloes, the tetrachloro-derivative of a new phenol, not yet isolated, which he calls aloesol. When oxidized this tetrachloro compound gives perchloro-quinone among other products, and when reduced by zinc in acetic acid solution dichloro-hydro-aloesol was obtained.—Pharm. Journ., Dec. 5, 1908, 726 ; from Journ. de Pharm. et Chim., *28* (1908), 469.

Esters of Arsenous Acid—Conditions of Formation.—W. R. Lang, J. F. Mackay and R. A. Gortner have prepared a number of esters of arsenous acid by heating alcohols and phenols in contact with arsenous oxide, using a reflux condenser with a Soxhlet attachment containing anhydrous copper sulphate to remove the water formed in the reaction, $6ROH + As_2O_3 = 2R_3AsO_3 + 3H_2O$; unless this is done only a small yield of ester is obtained. The percentage yield of various esters obtained in this way is as

follows: Propyl arsenite, 56.75; *iso*-butyl arsenite, 56.25; trimethyl carbinol arsenite, 54.27; amyl arsenite, 54.00; *iso*-amyl arsenite, 58.62; phenyl arsenite, 60.00; methyl arsenite, 33.8; ethyl arsenite, 4.5. The small yield of ethyl ester is accounted for by the fact that ethyl alcohol has a much greater attraction for water than methyl or the higher alcohols. Esters with the three cresols, naphthol, benzyl alcohol, and dihydric and trihydric phenols, and with methyl salicylate, have all been prepared. The reaction takes place very readily, and the esters all decompose with water, and are capable of dissolving considerable amounts of the arsenous oxide.—Pharm. Journ., July 25, 1908, 82; from Proc. Chem. Soc., *24*, No. 343.

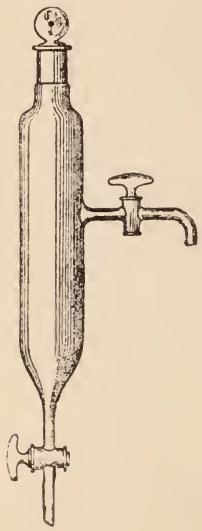
Aminophenyl Arsinic Acid—A New Isomeric Variety.—A. Bertheim's investigations demonstrate that the aminophenyl-arsinic acid obtained by reducing nitrophenyl arsinic acid is not identical with the one obtained by heating arsenic acid with aniline. The nitrophenyl-arsinic acid was prepared in the manner previously described by Michaelis (*Berichte*, 1894, 27, 263), and was reduced by means of hydrogen sulphide in ammoniacal solution, all traces of sulphur being subsequently removed from the reduction product by treating the aqueous solution with copper sulphate; the failure to do this was the cause of the want of success experienced by Michaelis in attempting the reduction by means of hydrogen sulphide. The present author also reduced the nitro-compound with sodium amalgam. The new aminophenyl arsinic acid dissolves in 50 parts of hot or 200 parts of cold water, and is practically insoluble in organic solvents; it crystallizes from water in colorless prisms, which melt at 214° C.—Pharm. Journ., July 18, 1908, 56; from Berichte, *41* (1908), 1655–1657.

Paraiodphenylarsinic Acid and *Paraiodphenylarsenic Acid Dioxide*, are compounds closely related to atoxyl, which are preliminarily described by Mameli and Batta. The first named is an arsenilic acid in which the amino group is replaced by iodine ($I-C_6H_4-AsO[OH]_2$). It is an infusible substance, soluble in alcohol, acetone and hot acetic acid, crystallizing from the latter on cooling in form of small, shining, white crystals. The di-iodide ($I-C_6H_4-AsI_2$), is a golden yellow body, melting at 80° C., and soluble in warm acetic acid.—Pharm. Ztg., liv (1909), No. 21, 210; from Boll. Soc. Med. Chir. Pavia.

Arsacetin—Tests of Distinction from Atoxyl.—Arsacetin, the acetamide of atoxyl, has the advantages over atoxyl that it is less toxic, and that it may be sterilized in an autoclave at 130° C. without decomposition. A. Labat says that it may be distinguished from atoxyl by a number of reactions, among which are the following: Ten per cent. aqueous solutions are used. On mixing a drop of the atoxyl solution on an object-glass with a drop of a 1 per cent. solution of cobalt nitrate, nickel chloride, manganese sulphate or magnesium sulphate, there is obtained a crop of small crystals,

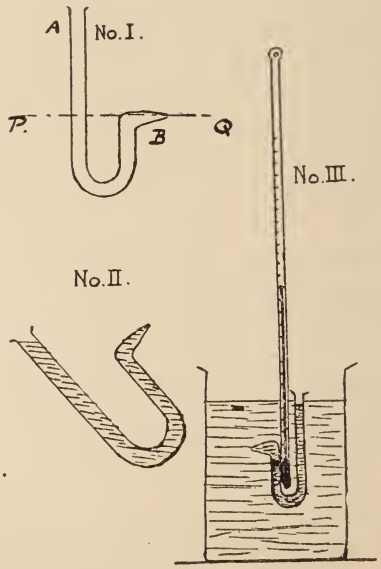
sometimes resembling those of ammonio-magnesium phosphate. In the case of manganese sulphate a small part of the precipitate is amorphous, but all the rest is crystalline. Arsacetin, on the contrary, gives an amorphous precipitate with cobalt nitrate and manganese sulphate, but none at all with the other reagents. On mixing 1 Cc. of 95 per cent. alcohol and two drops of atoxyl solution a crystalline precipitate is formed, but none with arsacetin. On mixing 1 Cc. of the atoxyl solution with 1 Cc. of 5 per cent. sulphuric acid there is formed a very light crystalline deposit; with a solution of half the strength there is no reaction. Arsacetin, under these conditions, gives a precipitate so dense that a magma is produced. In both cases the crystals are in the form of hexagonal tables. On adding bromine water, drop by drop, to 1 Cc. of the atoxyl solution there is formed an amorphous precipitate surmounting a pale yellow liquid. With arsacetin the precipitate formed is deposited in tufts of fine needles, easily observed under slight magnification. When 0.20 Gm. of arsacetin is heated with 10 Cc. of a mixture of equal parts of alcohol and sulphuric acid the odor of acetic ether is given off; atoxyl gives no such odor.—Pharm. Journ., Jan. 16, 1909, 60; from Bull. Soc. de Pharm. de Bord., Nov., 1908, 289.

FIG. 59.



Separatory.

FIG. 60.



Melting-point Apparatus.

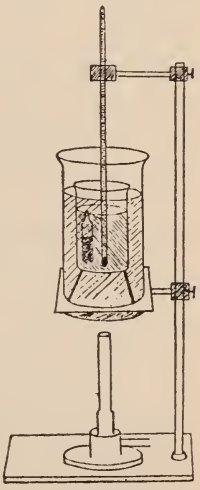
FIXED OILS.

Oils and Fats—Separatory for Non-Saponifiable Matter.—Wittels and Wellwart have devised the separatory shown by Fig. 59, which avoids the

necessity of repeatedly withdrawing the solution of saponified fats and oils during the process of shaking out unsaponified matter by means of ether or benzin. The soap solution is introduced into the separatory and filled with water to just below the lateral faucet shown in the drawing. It may then be shaken repeatedly with fresh portions of benzin, and the solution of non-saponifiable matter withdrawn through the lateral faucet without disturbing the aqueous soap solution.—Apoth. Ztg., xxiii (1908), No. 95, 863.

Fats, Waxes, Etc.—Simple Method for the Determination of Melting Points.—P. B. Dallimore suggests the apparatus shown in detail by Nos. 1, 2 and 3, Fig. 60, for conveniently determining melting points of fatty acids, waxes, and the like. It consists of a small U-tube (I) of very thin glass, one arm slightly longer than the other, the longer arm (*A*) being slightly expanded at the mouth to facilitate the pouring in of the substance to be examined. The short arm (*B*) is bent over at right angles about half an inch from the bottom and drawn out to a fine point with only a small aperture. The melted substance is introduced, holding the U-tube in the position indicated by II, and when cool, the tube is tied on to a thermometer, and heated in a water or air bath, this arrangement being shown by III. When the melting point is reached, the weight of the substance in the arm *A*, above the level *P Q*, will force a drop of liquid out of the arm *B*, and will thus give a very good indication of the melting point.—Pharm. Journ., Dec. 19, 1908, 802.

FIG. 61.



Apparatus for Valenta's Test.

Valenta's Test for Fats and Oils—Value and Method of Application.—E. W. Pollard calls attention to Valenta's test for the valuation and identification of fats and oils, which he has found to be a test of extreme delicacy, but dependent on the strict observation of certain important factors. The test is the temperature at which a warm mixture of acetic acid and oil becomes turbid on cooling, and is, according to the recommendation of the author, to be carried out as follows—the simple apparatus necessary being shown in the accompanying drawing (Fig. 61): One gram of pure acetic acid, m. p. 15.6° C., is weighed from a small curved pipette into a thin glass bottle of about 4 Cc. capacity, without allowing the acid to touch the neck or sides. Any excess is absorbed by a tiny strip of filter-paper. One gram of oil is similarly weighed on top, and excess absorbed as before. The bottle is stoppered or well corked, and violently shaken in and out of a Bunsen till the contents are just clear. It is then pitched bodily into a double bath of two beakers containing

water heated to about 10° C. above the expected Valenta figure. An accurate thermometer passes to the bottom of the smaller beaker. The cooling is watched, and at the first sign of the oil and acid becoming turbid the reading is taken. This reading the author calls the "Weight-Valenta."

To carry out the test reliably and satisfactorily the acetic acid used must be of the right strength, which is best determined by the melting point if the acid is pure. When the test is applied to oils it is necessary to eliminate all moisture that would weaken the acid, and also to know the acid number, since oleic acid, being miscible with acetic acid, will lower the temperature considerably if present to any extent. The Valenta test is, in fact, an indicator of natural acidity or rancidity. The author gives numerous examples showing the application of the method, which he regards to be so simple that it "can be carried on as well by the apprentice at the counter, as by the analyst in his laboratory."—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 521–527.

Fixed Oils—Determination of Iodine Number.—Levi and Manuel find that the chloroform, which is both expensive and easily decomposed, may be replaced by carbon tetrachloride (or penta chlorethane) as a solvent in the determinations of the iodine number of oils. The results are practically identical. The carbon tetrachloride of commerce, however, should be purified by a method described by the authors, which see under "Carbon."

Fat—Method of Determination in Fiber.—Having failed to satisfactorily extract all the fat from a sample of husk (reported to contain 10 per cent.) by simple extraction with ether, F. H. Alcock successfully tried a method similar to the Werner-Schmidt method for the determination of fat in milk. Five Gm. of the husk was mixed with 3 Cc. of water and 10 Cc. of strong hydrochloric acid (1.16 sp. gr.) added and kept on the water-bath for three hours, then cooled and extracted three times with ordinary ether. The whole of the ether-washings were mixed, evaporated, dried and weighed, yielding a percentage very nearly the same as was stated in the contract certificate, viz., 9.8 per cent. The method seems capable of wide application.—Pharm. Journ., Dec. 5, 1908, 724.

Fixed Oils—Modification of Halphen's Reaction for Cotton Oil.—L. Garnier observes that in carrying out Halphen's test for cotton oil, which depends on the coloration produced when a sample of the oil is heated for three-quarters of an hour on a boiling water-bath with a 1 per cent. solution of sulphur in carbon disulphide, and amyl alcohol, varying results are obtained, according to whether the clear part of the sulphur solution or the liquid containing sulphur in suspension (that is in excess) is used. Concordant results are only obtained in the latter case, when the colorations produced are proportional to the amount of cotton seed oil present.

For this purpose carbon disulphide containing 2 per cent. of sulphur, in powder obtained from the roll variety, must be used. When this liquid is at rest excess of sulphur settles to the bottom of the containing vessel, but immediately before use it is shaken up to suspend the sulphur, and then mixed with the oil and the amyl alcohol. The tube is then connected with an upright condenser, and heated on the water-bath at gentle ebullition for one hour. On cooling a slight coating of crystallized sulphur is deposited at the bottom of the tube; the original volume of the liquid is then restored by means of carbon disulphide and transferred to tubes for comparison with a color scale made with an inactive oil, poppy oil, for example, containing 5, 10, 20, up to 75 per cent. of cotton seed oil, each strength in a separate tube, and made in the way described above. This scale should be preserved in corked tubes in the dark, and in a cool place.—Pharm. Journ., June 19, 1909, 826: from Journ. de Pharm. et. Chim., *29* (1909), 273.

Etholides—Coniferous Waxes Forming a New Class of Bodies.—P. Bougault and L. Bourdier, while investigating *Juniperus sabina* by the method of Bourquelot, isolated a white crystalline substance which had a certain resemblance to known vegetable waxes. Similar substances were found to occur in other conifers, in the berries and leaves of *Juniperus communis*, and in the leaves of *Pinus silvestris*, of *Picea excelsa*, and of *Thuja occidentalis*. These waxes were isolated by extraction with boiling alcohol (90 per cent.), from which they separate on cooling. The crude material thus obtained was purified by treatment with other organic solvents. The wax from *Juniperus sabina* melts at 73° to 78° C., and repeated crystallizations from various solvents afford a series of substances, melting from 65° to 84° C.; of these only one melting point, 82° C., could be considered pure. All these bodies were acids, although their acid value was low, ranging from 25 to 54; all contain at least one free alcoholic function, as shown by their acetyl value, and all are also esters, as shown by their relatively high ester values. All the saponification products are acids; none have a purely alcoholic function; that is, they contain no bodies analogous to glycerin or other alcohols. These saponification products are, in fact, acid alcohols. Hitherto only two such bodies have been known, one of which, an oxypalmitic acid, $C_{16}H_{32}O_3$, occurs in all the waxes examined, and forms a considerable portion of the wax of savin wax, melting at 72° C., 76° C., and 82° C. It has been named juniperic acid. It is suggested that the peculiar characters of these waxes, combining the functions of esters, acids, and alcohols, may represent a class of compounds, named etholides, having the structure—

$$R—CHOH—(CH_2)_u—COO—\underset{\displaystyle R'}{\underset{|}{CH}}—(CH_2)_m—COO—\underset{\displaystyle R''}{\underset{|}{CH}}—(CH_2)_p—\cdots\cdots COOH$$

—Pharm. Journ., Jan. 30, 1909, 120; from Compt. rend., *147* (1908), 1311.

Petroselinic Acid—A New Oleic Acid from the Oil of Parsley Seed.—E. Vongerichten and A. Köhler have isolated from the oil obtained from parsley seeds a fat crystallizing from alcohol-ether in fine needles. Its melting point is 32° C.; solidifying point, 16.5° C.; refractive index at 40° C., 1.4619; saponification value, 191.2; iodine value, 84.3. On saponifying the fat with alcoholic potash a new acid is obtained, to which the name of petroselinic acid has been given. It melts at 33.34° C.; solidifies at 27° C; has specific gravity at 40° C. of 0.8681, and refractive index at 40° C., 1.4533. The formula assigned to it is $C_{18}H_{34}O_2$. Several salts have been prepared, among them the lead salt, $Pb(C_{18}H_{33}O_2)_2$, which is insoluble in water, difficultly soluble in cold alcohol and ether, easily soluble in hot ether. The barium salt occurs in anhydrous needles, and has the formula $Ba(C_{18}H_{33}O_2)_2$; the zinc and magnesium salts also occur in white needles, and the silver salt, $AgC_{18}H_{33}O_2$ in a white granular powder. The iodine value of the acid is 89.9; Köttstorfer value, 198.6; acetyl value, nil. Its structural formula is $CH_3.(CH_2)_{10}.CH:CH.(CH_2)_4.CO.OH$. —Pharm. Journ., June 26, 1909, 862; from Ber. d. D. Chem. Ges., *42* (1909), 1638.

Almond Oil—Correction of the Elaidin Test of the Phar. Nederl. IV.—A recent complaint that almond oil supplied by Schimmel & Co failed to answer the elaidin test of the Dutch Pharmacopœia IV, leads that firm to remark that the pharmacopœial description of this test is so little precise that it may easily fail even with the best oil, according to the conditions of the test. Experiments, which are described, demonstrate that the reaction proceeds easily if this test is carried out as follows: 2 Cc. each of almond oil and nitric acid (sp. gr. 1.316° C.), are mixed with 1 to Gm. of mercury, and the mixture is left standing at a temperature of 10° C. After 6 to 10 hours, the layer of oil has congealed into a solid mass. A negative result, however, is not always a proof of an adulteration; in order to avoid deceptions, the test should in such case be repeated. The G. P., IV has taken the various drawbacks of the elaidin test into consideration, and gives exact directions with regard to quantity, time, and temperature (+ 10° C.), which should also have been considered in the Ph. Nederl. IV.—Schimmel's Rep., Nov., 1908, 16–17.

Bone Marrow—Composition.—J. Nerthing has submitted the red and yellow marrow of the bones of cattle to analysis with the following results: The fat from the yellow marrow consisted of 77.95 per cent. of oleic acid, 14.22 per cent. of stearic acid, and 7.83 per cent. of palmitic acid; that of the red marrow consisted of 47.38 per cent. of oleic acid, 36.25 per cent. of stearic acid, and 16.36 per cent. of palmitic acid. In the red marrow 0.2853 per cent. of cholesterin was found; in the yellow marrow 0.2968 per cent. Lecithin was found to the extent of 0.2017 per cent. in the red, and 0.1841 per cent. in the yellow. The glycogen content

amounted to 0.0398 per cent. in the red marrow. Iron was found to be present to the extent of 14.388 Mgm. in the yellow, and 8.533 Mgm. in the red marrow, per 100 Gm.—Pharm. Journ., Aug. 22, 1908, 236; from Biochem. Ztg., *10* (1908), 167.

Cacao Butter—Unsaponifiable Constituents.—In the course of unsuccessful experiments to isolate from cacao butter a body to which the characteristic taste of cacao might be attributed, Matthes and Rohdich subjected the unsaponifiable portion of the cacao butter, heretofore described as "phytosterin," to chemical investigation and succeeded in isolating several distinct bodies, namely: A hydrocarbon, $C_{30}H_{48}$, which must probably be regarded as "amyrilene," and two phytosterins, which are doubtless identical with the two bodies isolated by Windaus from calabar beans and described respectively as "stigmasterin" and "sitosterin." Matthes and Rohdich's investigations lead them to conclude that the crude phytosterins are in rare cases only single bodies; they are complex mixture of various bodies the separation of which presents great difficulties. —Pharm. Ztg., liii (1908), No. 55, 545; from Ber. d. D. Chem. Ges., *41*, 1591.

Cacao Fat—Determination in Cacao.—A. Kreuze recommends the following method for the determination of the fat in cacao, which is based upon the solvent effect of chloral alcoholate upon fatty bodies in general: Introduce 1 Gm. of cacao and 2 Gm. of dry chloral alcoholate into 100 Cc. Erlenmeyer flask and melt them together on the water-bath. The thin magma, which results in a few minutes, is strongly stirred so as to become homogeneous, and, while still hot, 10 Cc. of ether are added, the mixture being stirred so that the cacao is uniformly distributed; then 30 Cc. more of ether are added, the mixture well shaken and immediately filtered. The residue on the filter is washed three times with small quantities of ether, the ether is evaporated from the filtrate and washings in a water-bath, and the residual fat is dried to constant weight at 105°–110° C. in a drying oven.—Pharm. Ztg. liii (1908), No. 55, 546; from Ztschr. f. Unters. d. Nahrungsm., 1908, No. 11.

Japanese Tea Oil—Characters and Constants.—Mitsumarn Tsujomoto describes Japanese tea oil, obtained in the amount of 26–30 per cent. from the seeds of *Thea sinensis*, L., which must not be confused with the so-called "tea oil" frequently mentioned by European oil chemists, also known as "tsubaki" and "sasanqua oil." The tea oil under consideration is orange-yellow in color, has a disagreeable odor, and a bitter taste; solidifies at — 10° C., and when subjected to the elaidin test becomes viscous within two hours and congeals within 24 hours to a butter-like mass. Its sp. gr. at 15° C. is 0.9178; acid number, 0.74; saponification number, 191.91; iodine number, 90.42; Hehner number, 95.6; Reichert-Meissl number, 0.66; index of refraction at 20° C., 1.4707. The total fatty

acids form a white crystalline semi-solid mass at the room temperature, which has an average molecular weight of 283.91 and gives an iodine number of 92.82. To make this oil available for culinary purposes it must be freed from a saponin-like body associated with it.—Pharm. Ztg., liii (1908), No. 91, 900; from Chem. Rev. Fett u. Harzindustrie, *15*, 244.

Mafura Tallow and Mafura Oil—Properties and Constants.—Daniel and McCrae have examined the so-called "mafura tallow" and "mafura oil," two products obtained by the natives of Portuguese East Africa, from the seeds of

Trichili Emetica.—The *oil*, which is valued as a nutrient, separates on the surface of water after boiling the seeds; the *tallow* is obtained from the seeds by pounding them, and retains its solid consistence at a comparatively high temperature. The following constants have been determined for the two products:

	Oil.	*Tallow.*
Specific gravity, at 30/15° C.	0.920	0.909
Index of refraction	54.6	47.3
Melting point	—	29.5–38.0°
Saponification number	202.5	201.0
Iodine number	66.0	43.5
Acetyl number	36.5	16.0
Reichert-Wollny number	2.0	1.3
Unsaponifiable	0.8%	1.2%

—Pharm. Ztg., liii (1908), No. 91, 900; from Chem. Rev. üb. d. Fett-u. Harz-Industrie, 1908, 198.

Porpoise Oil—Reaction and Constants.—Hart has examined the oil from the porpoise (*Delphinus phocaena*) and found it to give the characteristic reaction of cod liver oil with sulphuric acid and chloroform, although in a less pronounced degree. The oil contained 1.39 per cent. of free acid, calculated as oleic acid and gave the following constants: Hübl. number, 109.3; Köttsdorfer number, 222.2 (cod liver oil shows only 171–189); Hehner number, 91.04.—Pharm. Ztg., liii (1908), No. 71, 995; from Chem. Ztg., 1908, No. 69.

Salvadora or Kakhan Fat—Source, Properties and Uses.—D. Hooper says that the fat expressed from the seeds of *Salvadora oleides*, a small tree or shrub indigeneous to Northern India, is used in Cutch as a "resist" in the process of dyeing cloths. From its low price and general characters it appears to be applicable to other industrial purposes, such as candle making. The fat, which is called *kakhan fat*, occurs in yellowish-white blocks, with a slightly rancid odor: Specific gravity, at 50° C., 0.9084; melting point, 41° C.; acid value, 11.26; saponification value, 242.36; iodine value, 7.48; Reichert-Meissl value 1.28; fatty acids, 9412 per cent.; titer value, 40° C.; acid value of fatty acids, 244.42; iodine value, 8.3. The fat saponifies easily. The low iodine value and

high saponification value distinguish kakhan fat from other Indian white fats, such as malabar tallow from *Vatera indica*, and kokam butter from *Garcinia indica*.—Pharm. Journ., Jan. 16, 1909, 60; from Agricult. Ledger, I (908), 1.

CARBOHYDRATES.

Carbohydrates—Color Reactions with Indol and Carbazole.—C. Fleig describes certain color reactions of carbohydrates with indol and carbazole which depend on the formation of furfurol, and can therefore be employed as tests for carbohydrates only in the absence of proteins liable to yield furfurol on hydrolysis with acids. The indol is employed in 1 per mille alcoholic solution and the carbazole in a saturated alcoholic solution. 0.5 Cc. of a dilute sugar solution is rapidly heated to boiling with 3 to 4 Cc. of pure hydrochloric acid (if the solution is colored, less acid or less sugar must be employed) and mixed with 3 to 4 drops of indol solution; a yellow to orange-red color will be produced. The reaction is given by xylose, arabinose, rhamnose, glucose, levulose, sorbose, galactose, maltose, lactose, saccharose, melecitose and raffinose, and less well by mannose. A positive reaction may also be obtained from inulin, dextrin, starch, glycogen, cellulose, glycuronic acid, pectin, pectic acid, gums and glucosides; but inosite and purely alcoholic sugars, with the exception of mannitol, give no color. In using carbazole, 0.5 Cc. of sugar solution is mixed with 1 to 2 drops of carbazole solution, and 1 Cc. of pure sulphuric acid is carefully added. A violet-red ring is formed at the junction of the two liquids. It is advisable always to carry out a blank experiment at the same time. A positive reaction is obtained with the same carbohydrates as in the case of indol, but the reaction is less delicate.—Pharm. Journ., Jan. 30, 1909, 128; from Journ. de Pharm. et Chim., *28* (1908), 385–392.

Inositol—A Most Widely Distributed Carbohydrate.—G. Mellière considers "inositol" to be one of the most widely distributed carbohydrates; it is met with almost universally, at certain stages of the organized existence, in both plants and animals. It is not confined to any one organ of the animal body; it seems to have been detected in all the parts examined. It is so plentiful in some invertebrates that certain annelids have been suggested as a favorable source of it. Animal products, such as cochineal, cantharides, and honey, contain it. Among plants, its presence appears to be almost universal at certain periods of the vegetative growth. It is specially plentiful in subterranean or etiolated parts, such as bulbs and rhizomes, and is found in greater quantity in rapidly growing plants, such as comprise the marsh flora and quickly grown culinary vegetables. Inositol occurs in parasitic plants, both those which have chlorophyll and those which have none. It invariably passes into fruits and seeds before they attain full maturity, and almost disappears from plant tissues after the ripening of these. Inositol cannot, therefore, be considered a waste prod-

uct, but is evidently a reserve material of great importance and of immediate service. It has a very close physiological affinity with the sugars, and coöperates with them in the various phases of plant growth. In the same way inosite may be used instead of sugars in various culture media in bacteriology. It is suggested by many observed facts that inositol may be converted into sugars, and sugars back into inositol, by certain special catalytic agents of the nature of diastases, which occur in plant tissues. Generally speaking, those plants which contain inositol in considerable quantity in the fresh state only show small traces when dried, and therefore galenical preparations of fresh drugs contain much more inositol than those made from dry material. In fact, its amount may form an indication of the care exercised in drying. Carefully dried digitalis contains a distinct amount of inositol, but the badly dried drug contains none. A very comprehensive list of vegetable and animal products containing it is given.—Pharm. Journ., Nov. 14, 1908, 626; from Journ. d. Pharm. et Chim., *27* (1908), 288.

Rye and Wheat Starch—New Micro-Chemical Distinction.—W. Lenz recommends a new micro-chemical test for the distinction between rye and wheat starch, which consists in magnifying 200 times a trace of rye starch in a drop of a solution of one part of sodium salicylate in eleven of water at room temperature. In an hour, more distinctly after twenty-four hours, most of the coarse grains of the starch are swollen, only a small part withstanding the action of the salicylate, and these still show the polarization cross between crossed Nicols. Wheat starch, thus treated, shows swelling of large isolated grains only, and these do not show the cross between the prisms. After one to twenty-four hours' action of the salicylate, the outline of wheat starch stands out boldly alongside the unswollen grains. The preparations must be so made that the grains lie alongside each other, and not in heaps.—Pharm. Journ., June 5, 1909, 769; from Trans. Intern. Congress of Applied Chemistry.

Commercial Starches.—E. N. Gathercoal reports the results of mixture determinations in a large number of commercial starches, in a paper printed in the "Proceedings" of this Association, 1908, 887–890.

Maple Sugar—Simple Tests.—A. P. Sy, of the Bureau of Chemistry, U. S. Dept. of Agriculture, proposes three simple tests for the purity of maple sugar and maple syrup. If sugar is to be tested, 5 or 15 Gm. are dissolved in enough water to make 5 or 15 Cc. of syrup, according to the tests, which are carried out as follows: (1) *Coloring-matter test:* Shake 15 Cc. of the syrup with 3 Cc. of amyl alcohol and 1 Cc. of 20 per cent. phosphoric acid. Allow to separate. The amyl alcohol layer should be a decided brown; adulterated samples give a straw to light-brown color. (2) *Foam test:* Mix 5 Cc. of syrup with 10 Cc. of water in a graduated cylinder and shake vigorously one-half minute. Allow to stand 10 min-

utes. The foam should measure not less than 3 Cc. Adulterated syrups give less foam. (3) *Precipitate test:* Mix 5 Cc. of syrup with 30 Cc. of water in a 25 Cc. measuring cylinder, add 2 Cc. lead subacetate test solution, mix well, and allow to stand 20 hours. The precipitate should measure not less than 3 Cc.—Bull. Pharm., Dec., 1908, 523.

Caramel—Detection in Wine, Brandy or Beer.—Dr. A. Jaegerschmid recommends the following method for the detection of caramel in wine or beer: 100 Cc. of the liquid are thoroughly mixed in a tall beaker with a solution of fresh egg-white and water, composed of equal parts, and heated with stirring until the albumen is coagulated. The liquid is then filtered, evaporated on a water bath to syrupy consistence, and one-half is extracted with ether, the other half with acetone. If caramel is present, the residue of evaporation from the ether solution gives a cherry-red color with a freshly prepared 1 per cent. solution of resorcinol in hydrochloric acid of sp. gr. 1.190, while the residue from the acetone solution gives a carmine-red color with concentrated hydrochloric acid alone.—Apoth. Ztg., xxiv (1909), No. 25, 218; from Ztschr. f. Unters. d. Nahr. u. Genussm., 1909, 269.

Milk Sugar—Quantitative Estimation.—Shimidzu, having found Fehling's Solution unsuitable for the volumetric determination of milk sugar, has resorted with advantage to the ammoniacal copper solution employed in the method of Kumagawa-Suto. This solution is prepared by dissolving 4 278 Gm. crystallized copper sulphate in sufficient distilled water to make 1000 Cc., on the one hand and 21 Gm. each of Rochelle Salt and potassium hydroxide in 300 Cc. of ammonia solution of sp. gr. 0.88, and sufficient distilled water to make 1000 Cc., on the other—these two solutions being kept in stock separately, and mixed in equal volumes (20 Cc. for an estimation), immediately before use. But even with this reagent it is impracticable to make a direct estimation of the milk sugar. It is necessary to resort to inversion, which, the author finds, results in the splitting up of the lactose into equal parts of d-glucose and d-galactose; and, further, this necessitated the determination of the reduction value of the d-galactose with that of d-glucose. Experiments showed the relation of the reducing power of d-galactose to that of d-glucose to be as 84.8 : 100, and that of the resultant mixture of the two to d-glucose alone, as 91.7 : 100. These results demonstrate that 0.0109 Gm. of milk sugar corresponds to 0.01 Gm. of glucose, which figures can be accepted for the titration with ammoniacal copper solution.—Pharm. Ztg., liii (1908), No. 89,880; from Biochem. Ztschr., xiii (1908), 243.

Milk Sugar—Test for Foreign Sugars.—Drs. Hillringhaus and Heilmann criticise some of the tests of purity for milk sugar prescribed in the German and Japanese pharmacopœias. They found that if the G. P. test for foreign sugars is carried out as prescribed, chemically pure milk sugar

may be condemned as impure unless certain precautions are observed as to temperature. This test is made repeatedly, shaking 15 Gm. of the powdered milk sugar with 50 Cc. of diluted alcohol during half an hour, then filtering. On adding an equal volume of absolute alcohol to 10 Cc. of the filtrate, no turbidity should be produced, and if the mixture is evaporated the residue should not weigh more than 0.04 Gm. The authors find, however, that comparatively small variations of temperature markedly affect the quantity of the residue. Thus, under the conditions of the test, chemically pure milk sugar yielded 0.028 Gm. of residue at 16° C., 0.050 Gm. at 28° C., and 0.056 Gm. at 31° C., temperatures which might be imparted by the warmth of the hand during the shaking, and similar results were obtained with a number of good commercial samples of lactose. The Japanese pharmacopœia prescribes another test, which was directed in former editions of the Ph. G., according to which 1 Gm. of milk sugar is sprinkled upon 5 Cc. of sulphuric acid contained in a shallow capsule. Exposed for one hour at a temperature not exceeding 15° C., the acid should assume only faint coloration. Here, also, the temperature is an important factor, and should in no case exceed the prescribed 15° C., although the concentration of the acid is immaterial as long as it is not below 92 per cent. H_2SO_4. An adulteration with as little as 1 per cent. of saccharose is quickly recognized: a distinct reaction sets in within a few minutes, and the carbonized cane sugar manifests itself by fine black dots when the product of reaction is viewed on a white ground. The authors recommend a revision of the official tests, with due consideration of the criticisms here submitted.—Pharm. Ztg., liv (1909), No. 11, 105; from Chem. Ztg., 1909, No. 10.

Sugar—Determination of End-reaction in Titrations with Fehling's Solution.—Menyhért recommends reagent paper saturated with potassium ferrocyanide and acetic acid for accurately determining the end-reaction in titrations with Fehling's Solution. So long as copper is held in solution a drop of the reacting fluid will produce a bright red ring surrounding a dark spot, and the reaction is ended when this bright peripheric ring no longer exhibits a red color, although, owing to the presence of suspended cuprous oxide, the central spot may continue to show a red color.—Pharm. Ztg., liii (1908), No. 81, 797; from D. Med. Wschr., 1908, No. 36.

Glucose—Definite crystalline compound with *Sodium iodide* which see under "Inorganic Chemistry."

Pure Levulose—Manufacture from Inulin.—Sigmund Stein finds that levulose, which cannot be obtained chemically pure from invert sugar or molasses, can be made perfectly pure on a large scale from inulin. This is found to the amount of 10–12 per cent. in dahlia bulbs, 6 to 11 per cent. in chicory roots, and is also abundant in the Jerusalem artichoke (*Helianthus tuberosus*). The raw material (dahlia bulbs or chicory root)

is first cut, then steamed, with the addition of milk of lime, pressed in hydraulic presses, and the juice clarified. The latter is poured into a revolving cooler, where it is frozen into flakes. The flakes are transferred to a tossing apparatus, after which the juice is centrifugalized. The inulin so produced is washed and cleaned. The product is then dissolved in hot water, treated with diluted acids, and converted thus into levulose. The levulose solution is evaporated *in vacuo* to the consistence of a syrup.—Pharm. Journ., July 4, 1908, 8; from Proc. Internat. Congress of the Sugar Industry, Paris, 1908.

Maize-Maltase—Properties—R. Huerre has experimented on the ferment in two varieties of maize grown in the Landes, "early white" and "early yellow." The ferment of the white variety was found to be most active at 40° C., although it works at quite low temperatures; it is destroyed by heating for two hours ar 50° C. In these properties it resembles Lintner's yeast maltase. Yellow maize contains a different ferment acting at a much higher temperature. It is most active at 60° C., and works between 22° and 80° C.; for this reason it has been called "high maltase."—Pharm. Journ., April 10, 1909, 494; from Compt. rend., *148* (1909), 300.

Manna-like Products—Constituents of Certain Kinds.—A. Ebert has determined the constituents in a number of manna-like products from various sources. He finds that *Trehala*, the sweet principle found in the cocoons of a beetle occurring on *Echinops persicus* and other species of *Echinops*, contains neither saccharose nor glucose; it gives 17.5 per cent. of trehalose, 27.08 per cent. of mucilage, and 31.78 per cent. of starch and cellulose. Trehala starch does not give a blue reaction with iodine, but a brown color. *Terendschabin*, the chief sweet purgative used by Persian doctors, derived from *Alhagi mannorum*, contains only saccharose and no glucose; it gave besides 5.2 per cent. of moisture, 9.35 per cent. of ash, and 20.35 per cent. of mucilage. The *Manna of Salix fragilis* contains 17.45 per cent. of dextrose and 13.27 per cent. of saccharose; much gypsum was present as in impurity. The *Manna of Quercus vallonia* gave 53.20 per cent. of saccharose, 19.0 per cent. of glucose, but no invert sugar. The *Manna of Cotoneaster nummularia* contains 37.5 per cent. of glucose, 12.9 per cent. of saccharose, and 24.2 per cent. of mucilage. These are all of Persian origin. *Eucalyptus manna* from *Eucalyptus gunnii*, var. *rubida*, contains melitose, 68.49 per cent.; glucose, 20.86 per cent.; invert sugar, 2.14 per cent.; mucilage, 3.22 per cent.; wax, 0.11 per cent.; ash, 6.78 per cent.; moisture, 9.74 per cent.; and residue, 4.27 per cent. *Eucalyptus pulverulenta* yields a manna containing 21.35 per cent. of melitose, 16.15 per cent. of fructose, and 60 per cent. of saccharose. *Tabaschir*, a siliceous secretion of the interior of bamboo stems, consists of about 90 per cent. of inorganic matter, with 4.25 per

cent. of saccharose and 2.6 per cent. of mucilage. No single saccharine substance examined contained any mannitol found in true *Fraxinus* manna. The author has been unable to confirm the statement of Raby as to the existence of "chirkhesite" and "Bidenguebinose" in the manna of *Salix fragilis*, nor of specific sugars in *Cotoneaster* manna. Although *Echinops persicus* belongs to the Compositæ, which usually contain no starch, starch granules could be detected in its tissues, reacting with iodine like those found in trehala. By oxidation with nitric acid the mucilage of all the above mannas, except that of *Alhagi mannorum*, affords mucic acid; the last-named gives instead oxalic acid.—Pharm. Journ., Feb. 27, 1909, 273; from Ztschr. d. Allgem. Oesterr. Apoth.-Ver., *46* (1908), 427 *et seq.*

Perseulose—A New Sugar.—Bertrand has obtained by the oxidizing action of a very active sorbose-bacterium upon perseit, a new crystalline sugar containing seven carbon atoms. The new sugar, which the author has named "perseulose," has a pronounced sweet taste, is levorotatory, and reduces Fehling's Solution with greater energy than does sorbose, although with less than ordinary glucose.—Pharm. Ztg., liii (1908), No. 81, 197; from Compt. rend., *147*, 201.

Styracit—Preparation from the Fruit-rind of Styrax Obassia; Characters.—In a previous paper (see Proceedings, 1908, 207), Y. Asahina mentioned the presence of a crystalline substance of the composition $C_6H_{12}O_5$, in the rind of the fruit of *Styrax obassia*, Sieb. et Zucc, which appears to be a body closely related to mannit, dulcit, etc., and has been named styracit. He has now prepared it on a larger scale, by boiling the rinds in water, evaporating the decoction to an extract, and boiling this extract with 3 portions of 90 per cent. alcohol. On distilling off the alcohol and cooling the residue, a crystalline magma resulted, which, after washing with alcohol on a suction filter and drying, yielded crystals possessing only little color. These were then purified by solution in water, treated with animal charcoal until the solution was completely decolorized, and evaporated to crystallization. So obtained, styracit has the following properties in addition to those described before (loc. cit.): It crystallizes from alcohol in needle-shaped prisms, and from water in large, stout, transparent rhombic prisms, resembling Epsom Salt, frequently having well-developed facets. The optical rotation, also, is corrected to $(a)_D = -56° 47'$. The author has obtained and describes the products obtained from styracit by the action of benzoylhydrate (*tetrabenzoylstyracit* $= C_6H_8[O.COC_6O_5]_4O$); nitric-sulphuric acid (*styracit tetranitrate* $= C_6H_8(ONO_2)_4O$, and concentrated sulphuric acid (*styracit-di-sulphuric acid*). By oxidation with nitric acid styracit yields oxalic acid—this being the only oxidation product obtained by various methods and conditions.—Arch. d. Pharm., *247* (1909), No. 2, 157–160.

ORGANIC ACIDS.

Acetic Acid—A By-Product from Acetone-Chloroform Residues.—D. B. Dott, conceiving that the residues from acetone-chloroform manufacture retain a considerable amount of acetic acid produced during the reaction, has experimented directly with a mixture of 0.5 kilo. of bleaching powder, made into a thin paste with water at 30° C., and 45 Gm. of acetone. After distilling off the chloroform completely, the filtrate and washings from the residue were concentrated, acidulated with sulphuric acid, and then an excess added equivalent to all the acetate possibly present. The sulphate having been filtered off, the solution was distilled, and the distillate by appropriate tests determined to contain 7.92 Gm. HCl and 18.08 Gm. acetic acid.—Pharm. Journ., July 18, 1908, 54.

Glacial Acetic Acid—Formic Acid a Contaminant.—Ost and Klein have found glacial acetic acid contaminated to the amount of 0.5 per cent., and furthermore that this impurity could not be detected by the usual methods of examination.—Pharm. Ztg., liii (1908), No. 72, 702; from Chem. Ztg., 1908, No. 69.

Agaricic Acid—Action of Alkali Dichromate.—The chemists of the J. D. Reidel Co., acting on agaricic acid with alkali dichromate, have obtained "methylheptdecyl-ketone" ($C_{17}H_{35}$—CO—CH_3), which Thoms and Vogelsang have previously obtained from the same substance by other methods, and Kraft has produced from other material. The method of Riedel yields both a larger and purer product than that of Thoms and Vogelsang. Stearylacetonedicarbonic acid, which is probably an intermediate product of both reactions, could not be isolated.—Pharm. Ztg., liv (1909), No. 19, 187; from Riedel's Report, 1909.

Allophanic Acid—A Remarkable Chemical Compound.—Overlach calls attention to the remarkable properties of allophanic acid, a product obtained during the "thirties" of the last century by Liebig and Wöhler by the action of cyanic acid on alcohol and originally described by them as "cyanic ether." Some fifteen years later, however, the same chemists found that this compound was not a cyanic ether; that it did not contain cyanic or cyanuric acid, but was in reality a new and peculiar acid, and being so different from what had been expected they gave to it the name, "allophanic" acid, a name derived from the Greek and signifying "something else than was supposed." Subsequently a series of salts of allophanic acid were prepared, but neither these nor the acid itself were found to possess noteworthy therapeutic properties. Indeed, according to Overlach the acid is therapeutically quite inert. On the other hand the acid is likely to prove useful on account of its remarkable property of converting certain liquid compounds into solid compounds, rendering some disagreeably tasting liquids with which it combines tasteless, others, which are malodorous, inodorous, and yet leaving them therapeuti-

cally fully effective, since the compounds formed are decomposed in the human organism after administration—the allophanic acid splitting up into harmless carbonic acid and urea, while the therapeutic agent is liberated unchanged and under conditions favorable to its effectiveness.

Allophanic acid has the composition represented by the formula $NH_2.CO.NH.CO$. With certain bodies it forms compounds having the constitution of esters, several such being described by the author, as follows:

Santalol-Allophanic Acid Ester forms a dry, white, crystalline powder having a faint aromatic odor, perfectly tasteless and absolutely non-irritant. It has the composition $OC_{15}H_{23}.NH_2.CO.NH.CO$, and is gradually split up in the alkaline juices of the intestines in santalol, carbonic acid and urea.

Ricinus Oil-Allophanic Acid Ester is obtained in form of a white, tasteless and odorless, dry powder, containing 78.3 per cent. of ricinus oil and having the formula $C_3H_5O_3—(C_{18}H_{32}O_2—CO.NH.CO.NH_2)_3$.

Creosote-Allophanic Acid Ester is obtained in form of a light gray, nearly tasteless, dry and stable powder having a faint smoky odor. It is slowly split up in the alkaline intestinal juices, with elimination of creosote unchanged.

Guaiacol-Allophanic Acid Ester forms stout, brilliant white, crystalline needles, absolutely tasteless and faintly odorous, with the therapeutic activity of pure guaiacol.—Pharm. Ztg., liii (1908), No. 65, 637–638; from Berl. klin. Wschr., 1908, No. 30.

Benzoic Acid—Conversion into Salicylic Acid by the Electric Current.—Bargellini and Jughilleri have observed the conversion of benzoic acid into salicylic acid by the action of the electric current. They have demonstrated that when a solution of 10 Gm. of benzoic acid in 75 Cc. of acetic acid and 300 Cc. of water is subjected to the action of an electric current of 8 volts, salicylic acid is formed. For this purpose the authors employed a beaker in which the bottom was covered with a layer of mercury, while the other pole consisted of a sheet of platinum foil of 719 Cc. in dimensions. The best temperature for the reaction was found to be between 50° and 60° C.—Pharm. Ztg., liv (1909), No. 4, 38; from Chem. Ztg., 1908, No. 100.

Benzoic Acid—Detection in Foods.—A. Jonescu observes that the want of a definite and sensitive reaction for benzoic acid has rendered its detection as an added preservative to alimentary articles more or less difficult. This may be overcome by converting the benzoic into salicylic acid by means of hydrogen peroxide in presence of a mineral acid. Two reagents are prepared—a 1 : 10 aqueous dilution of hydrogen peroxide, and a 1 : 10 dilution of the French Pharmacopœia ferric chloride solution. One Cc. of a 1 : 1,000 aqueous solution of benzoic acid treated with one drop of each of these reagents gradually shows the characteristic violet color-reaction in the cold, which persists for several hours; on plunging

the mixture into boiling water the color is formed more rapidly. The test may be applied to ether residues obtained by shaking out distillates from a variety of dietetic articles. It is easy to detect 0.25 Gm. of sodium benzoate in 500 Cc. of milk by the test. Ten Cc. of sulphuric acid is added and the mixture distilled. The first 50 Cc. of distillate is shaken out with ether, and the ether residue tested as above. Saccharin behaves like benzoic acid in the presence of ferric chloride and hydrogen peroxide. —Pharm. Journ., June 26, 1909, 862; from Journ. de Pharm. et Chim., *29* (1909), 523.

Benzilic Acid—Preparation.—According to H. v. Liebig, large quantities of benzilic acid free from benzoic acid can be prepared by dissolving equal weights of benzile and caustic potash in twice the weight of water, and adding alcohol. The vessel is then heated on the water-bath to boiling point for ten or twelve minutes, and the contents are turned into a beaker. The crystalline mass is drawn off after some hours, dissolved in cold water, and dilute sulphuric acid is added to the filtered solution, when benzilic acid separates out.—Pharm. Journ., Aug. 29, 1908, 258; from Ber. d. D. Chem. Ges., xli (1908), No. 81, 908.

Chlorogenic Acid—Distribution in Plants.—In continuation of previous investigations, which have demonstrated that the so-called caffeotannic acid is not a single body, but a mixture of several acids, among which two crystalline acids (chlorogenic and caffalic acids) have been isolated and studied, Dr. K. Gorter has extended his investigations to a large number of plants, and mentions some 230 different species belonging to different genera and representing many families. He finds that in 98 cases distinct reactions for chlorogenic acid can be obtained, and from this observation, and its comparative abundance in some instances, he suggests the possibility that chlorogenic acid may have some significance as reserve material in the development of certain plants, passing by the action of hydrolytic enzymes from chlorogenic acid into quinic acid, which then exercises its function in the further development of the plant. As has been demonstrated by the author, chlorogenic acid is readily hydrolyzed by alkalies into caffeic and quinic acids according to the following equation: $C_{32}H_{38}O_{10} + H_2O = 2C_9H_8O_4 + 2C_7H_{12}O_6$. The reaction with acids, however, is quite different. Boiling with weak acids (acetic, tartaric) do not affect it, but the stronger acids, such as oxalic, hydrochloric and sulphuric acid, decompose the greater part of the chlorogenic acid with evolution of carbonic acid, and formation of a compound or compounds requiring further study. The product of reaction, however, produces a very characteristic reaction with ferric chloride, and upon this the author bases a method for its detection in plants, which may be consulted in the original paper, in Arch. d. Pharm., *247* (1909), No. 3, 184–196.

Chrysarobin—Improvement in B. P. Characterization and Tests.—D. B.

Dott observes that while the name "chrysarobin," applied to a mixture obtained by the official B. P. process, is not objectionable, the official description of characters and tests can undoubtedly be improved. Instead of "only slightly soluble in water," it would be better to say "nearly insoluble in water;" "partially soluble in petroleum spirit" should rather be "partially and sparingly soluble in petroleum spirit," and while it is correct to say "almost entirely soluble in hot alcohol," "not readily soluble" or similar qualification should be included. Although an exact melting point can not be established in a variable mixture of resins, it appears to the author quite practicable to establish such within a certain range—possibly 154°–158° C.—but a greater number of samples should be tested before stating a positive limit.—Pharm. Journ., July 18, 1908, 54.

Cinnamic Acid—Conversion into Styrolene by Moulds.—Owing to a lack of details, biologists have not generally accepted the statement of Oliviero in 1906 that *aspergillus niger* and *penicillium glaucum* (see Proceedings 1907, 755) have the power of converting cinnamic acid into styrolene. In consequence, R. O. Herzog and O. Ripke have repeated the experiments, and fully confirm Oliviero's statements. They have found that the moulds of beer readily yield styrolene when acting on ammonium cinnamate. This fact is of considerable interest as supporting the theory of certain biologists that the petroleums are the residual products of the action of organisms on organic matter which existed at the earliest geological period. It is inferred that the carbohydrates and nitrogenous bodies were decomposed by microbes, and that fats and waxes, after being saponified, became the original matter from which petroleum was formed. These experiments support the view that hydrocarbons may have formed from fatty acids by the action of organisms, and that petroleums may have resulted from these less complex hydrocarbons by polymerization or condensation.—Pharm. Journ., March 27, 1909, 424; from Ztschr. Physiol. Chem., *57* (1909), 43.

Lithium Citrate—Simple Test of Purity.—Lithium being chemically associated with sodium and potassium, the presence of salts of these may be expected as an impurity in the citrate. F. M. Alcock observes that, although the pharmacopœial tests, and particularly those of the U. S. P., are sufficient to establish the purity of lithium citrate, these tests are conveniently replaced, in so far as the presence of sodium and potassium salts are concerned, by taking advantage of the solubility of the lithium salt in concentrated hydrochloric acid and the insolubility of the sodium and potassium salts in that acid. He finds that if the lithium carbonate or citrate dissolves abundantly in strongest aqueous solution of hydrochloric acid and gives no precipitate at all on long standing, no potassium or sodium of any serious moment, as far as amount is concerned, need be suspected. When hydrochloric acid is added to a saturated solution of

the chlorides of these three alkalies, those of sodium and potassium are precipitated, and the precipitation is rendered more complete if the hydrochloric acid gas is passed into the solution to complete saturation. The lithium chloride remains in solution.—Pharm. Journ., Nov. 7, 1908, 586.

Sodium Citrate.—Addition to Cow's Milk for Infant Feeding. See *Citrated Milk* under "Albuminoids."

Formic Acid—Quantitative Estimation.—Owing to the extraordinary reactivity and the paucity of insoluble saline compounds of formic acid, its quantitative estimation presents particular difficulties. The methods heretofore in use are mostly based on the oxidation of the acid, but usually fail in the presence of other oxidizable substances. The question has now been carefully studied by Auerbach and Plüdermann, who have satisfactorily solved the problem of its quantitative estimation by a modification of the method described by Portes and Ruyssen. The formic acid is oxidized with an excess of mercuric chloride, in the presence of sodium acetate, and the excess of mercuric chloride is ascertained by titration with potassium iodide. The reaction between the mercuric salt and the iodide is, however, not absolutely perfect, and a correction-factor must therefore be employed in the calculation, the details of which, as well as of the method in general, must be consulted in the original. The proposed method has yielded excellent results.—Pharm. Ztg., liv (1909), No. 19, 187; from Arb. a. d. Kaiserl. Gesundheitsamte xxx (1909), No. 1.

Formic Acid and Formates—Satisfactory Commercial Quality.—George Luman observes that while the pharmacology of formic acid and its salts is still in a nebulous condition, they have come into general use during the last four years, it is timely for the pharmacist to examine the commercial formates and to advise how they can be best exhibited in the most compatible and palatable form. In his experience, based on recent examination, they are practically supplied in an almost pure condition. There has been a tendency to give too large doses; but, seeing that formic acid is the lower carbon homologue of the series of fatty acids with the general formula of $C_nH_{2n}O_2$, there is no evidence that in a proper dose the salt or the acid should have toxic effects.

Formic Acid (aminic or carboxylic acid) is generally sent out with the label of "Acidum Formicum," containing 25 per cent. of absolute acid (H.COOH), and has the sp. gr. 1.06, a dose of 10 minims representing practically 2.5 grains of acid; but a 100 per cent. acid, sp. gr., 1.24, can readily be procured, while a 90 per cent. acid, sp. gr. 1.2, is supplied when required for manufacturing and dispensing purposes.

Calcium Formate ($Ca(COOH)_2$) is supplied in small glistening crystals, almost anhydrous and practically pure, without tendency to deliquesce. Maximum dose, 5 grains.

Lithium Formate ($Li.COOH.H_2O$), prepared by the author, was slightly

hygroscopic, but not deliquescent to the same extent as the potassium and sodium salts. The dose should not be greater than that given in the "B. P. Codex." It is said to be best administered in effervescent granular form.

Potassium Formate (K.COOH) is quite deliquescent and troublesome to prepare, the difficulty of crystallizing and drying being considerable. Though reputed to be anhydrous, the salts examined retained from 1 to 2 per cent. of moisture when dried at 80°–90° C. The dose given in the "B. P. Codex" (30 grains) is considered excessive; it should not exceed a maximum of 10 grains.

Sodium Formate (Na.COOH.H_2O) is supplied in a reasonably pure state. It is also deliquescent, but somewhat less than the potassium salt. The salt occuring in white crusts contained about 1 per cent. of moisture in addition to the molecule of water of crystallization; that supplied in rhombic crystals did not. The dose should not exceed 10 grains.

Strychnine Formate ($C_{21}H_{22}N_2O_2$.H.COOH.$2H_2O$) which is also found in an anhydrous condition in commerce, has a tendency to effloresce and lose a half molecule of water of crystallization. It may be rendered completely anhydrous by heating below 90° C., and thereafter is stable. A dose of $\frac{1}{30}$ grain contains only $\frac{1}{300}$ of a grain of the formic radical.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 411–414.

Chromium Formates and Acetates—Characters and Preparation.—According to A. Werner, the formates and acetates of chromium can be divided into two groups: (*a*) normal salts; (*b*) complex salts. The normal salts may be prepared in crystalline form by adding the organic acid to the dihydroxysulphate. The *formate* is greenish-grey and the *acetate* blue-violet. The stability decreases as the magnitude of the fatty acid increases. So, for example, the *butyrate* is so unstable that it decomposes spontaneously in a few days. When moist chromium hydrate is heated with formic acid until it all dissolves, dark green crystals separate out on cooling. These have the formula $Cr_3(O.COH)_7(OH)_2 + 5H_2O$. With nitric acid they give crystals of the composition $[Cr_3(O.COH)_6(OH)_2]NO_3 + 5H_2O$. Other salts of the same type can be prepared by the action of mineral acids on the nitrate.—Chem. News, Dec. 4, 1908, 282; from Ber. d. Chem. Ges., *41* (1908), No. 14.

Glycyrrhizic Acid—Formula and Constitution.—A. Tschirch and S. Gauchmann report the results of a comprehensive study of the composition of glycyrrhizic acid—the glycyrrhizin of former authors—which has only very recently been successfully prepared in a pure condition. Previous investigations have demonstrated that glycyrrhizic acid contains no nitrogen, that it has the empirical formula $C_{44}H_{64}O_{15}$, and that by hydrolysis it splits off "glycyrrhetic acid" ($C_{31}H_{45}(OH)_2COOH$), and an acid of the formula $C_6H_{10}O_7$, apparently

Glucuronic Acid.—The authors now incontrovertibly prove by their investigation that, as supposed, this second acid is really glucuronic acid, and thus that this acid is not alone a constituent of the animal organism, but that it is also found in plants in the form of a glucoside-like body. Regarding the constitution of the other hydrolytic product, the

Glycyrrhetic Acid, the investigations of the authors demonstrate that it is a dioxymonocarbonic acid having the formula $C_{31}H_{45}O_3.OH.OH.COOH$. This acid contains at least one double linking. Methoxyl- or ethoxyl-groups are not present. Although its presence has not been determined with certainty, it seems probable that naphthalin is the hydrocarbon which constitutes the nucleus of the compound.—Arch. d. Pharm., *246* (Sept. 28, 1908), No. 7, 545–558.

Glycyrrhizic Acid.— Occurrence in Other Plants.—Following the preceding investigation, the same authors report the results of their research on the roots of *Periandra mediterranea* and on the so-called "monesia bark," with the object of determining the sweet body evidently contained in them. By special processes described they have succeeded in isolating glucosidal bodies from them, which proved to be identical with the glycyrrhizic acid from licorice.—*Ibid.* (Nos. 7 and 8), 558–565.

Igasuric Acid—Identity with Chlorogenic Acid.—Dr. K. Gorter, having obtained the characteristic reaction for chlorogenic acid (which see) in both the leaves and seeds of *strychnos nux vomica* has made experiments which demonstrate that igasuric acid is absolutely identical with chlorogenic acid.—Arch. d. Pharm., *247* (1909), No. 3, 197–200.

Picric Acid—Estimation by Means of "Nitron."—Bush and Blume utilize the property possessed by picric acid of forming a stable, easily crystallized, and insoluble compound with "nitron" (a complex pyrrol derivative, which see in Proceedings, 1907, 835). 150 Cc. of the solution to be analyzed, which should not contain more than 0.1 per cent. of picric acid, is acidified with 1 or 2 Cc. of dilute sulphuric acid and heated until it just commences to boil. Then slowly add 10 Cc. of solution of nitron acetate (10 per cent of nitron in 5 per cent. acetic acid), collect the precipitate, wash it with 50 to 100 Cc. of cold water, and dry for an hour at 110° C. The weight obtained, multiplied by $\frac{2}{5}\frac{2}{4}\frac{9}{1}$ gives the picric acid. The determination is accurate even in the presence of much sulphuric acid, and is available even in dilutions containing 1 : 250,000 of picric acid. The solution, which is still yellow in this dilution, is completely decolorized after filtering off the precipitate. The formula of

Nitron Picrate is $C_{20}H_{16}N_4.C_6H_3O_7N_3$. The picrates of pyridine and quinoline may also be determined by this method, and the presence of a certain amount of alcohol does not interfere; but the absence of hydrobromic, hydriodic, chloric, perchloric, nitrous, nitric, or chromic acid must be determined.—Pharm. Journ., July 18, 1908, 56; from Ann. de Chim. Analyt., 1908, 204, through Ztschr. f. angew. Chem., 1908, 354.

Picric Acid—Coloring Properties.— Léo Vignon finds that the color of picric acid in different solvents varies in the same way as the electrical conductivity of these solutions. Aqueous solutions of picric acid dye wool, and decrease in strength when their conductivity reaches a certain value. This condition may be produced either by increasing the quantity of picric acid in the solution or by adding an acid, such as hydrochloric, to the bath. In alcoholic solution the fixation of the coloring matter is very slight in the presence of $\frac{1}{10000}$ of hydrochloric acid, in spite of the conductivity. Apparently the fixation of picric acid on wool is due to a chemical reaction of the fiber on the coloring matter strongly ionized in water.—Ch. News, May 21, 1909, 252; from Compt. rend., *148* (1909), No. 13.

Salicylic Acid—New Gravimetric Method of Estimation.—In a preliminary communication to the Paris Pharmaceutical Society, J. Bougault directs attention to a new gravimetric method for the determination of salicylic acid, and to separate it from mixtures of cinnamic and benzoic acid. The method is based on the final result of the action of iodine on phenol or salicylic acid in the presence of alkali, which results in the formation of the extremely insoluble red compound, $C_6H_2I_2O$, of Lantermann. —Pharm. Journ., Aug. 1, 1908, 112; from Journ. de Pharm. et Chim., *28* (1908), 84.

Salicylic Acid—Reduction to Salicylic Aldehyde.—H. Weil has made the observation that sodium salicylate may be reduced with the greatest ease, by means of sodium amalgam, in aqueous solution in presence of boric acid at the ordinary temperature. Fifteen grammes of salicylic acid is neutralized with about 5.5 Gm. of sodium hydroxide and diluted to 1 liter, then 18 Gm. of *p*-toluidine is dissolved in the heated liquid with vigorous stirring and allowed to cool, and 250 Gm. of sodium chloride added. Into this mixture are placed 15 Gm. of boric acid, and then, with constant stirring, 330 Gm. to 430 Gm. of 2 per cent. sodium amalgam, gradually added. The reduction is complete when a filtered portion of the mixture yields no separation of salicylic acid on acidifying. The supernatant liquid is drawn off, and, after acidifying the residue with diluted acid, it is distilled in a current of steam. Salicylic aldehyde distils over and toluidine salt remains. The product is about 7.5 Gm.— Pharm. Journ., Jan. 17, 1909, 60; from Berichte, 1908, 4147.

Salicylic Acid—Composition of the Product of Reaction with Iron.— The composition of the intensely colored product resulting from the reaction of salicylic acid and ferric salts upon each other has been the subject of study by Hopfgartner, who has demonstrated the existence of two distinct crystallizable compounds of the acid with the tri-valent iron, namely: I. $Fe(OH)(C_7H_5O_3)_2 + H_2O$, and II. $Fe_4O(OH)(C_7H_5O_3)_9$. Both of these compounds are convertible into each other by simple processes. The

first of these (compound I) is soluble in water and in diluted ferric chloride solution with a violet color, and must therefore be regarded as the immediate product of the salicylic acid-iron reaction. Perfectly analogous compounds were also obtained by means of 5-bromosalicylic acid, and examined. Furthermore, the author finds that

p-Oxybenzoic Acid also yields a compound corresponding in formula, although not in all of its properties, to the first salicylic acid compound (I); but a compound resembling the second formula (II) was not obtainable.—Pharm. Ztg., liii (1908), No. 89, 880; from Monatsh. f. Chem., 1908, No. vii.

Acetyl-Salicylic Acid—Variable Melting Points of the Commercial Product.—Hermann Dichgans has determined the melting point of sixteen different specimens of acetyl-salicylic acid, and found one-half of them to have lower melting points—130°–133° C.—than should be demanded from the pure product. The other eight specimens, melting at 135°–137.5° C., were regarded by the author to be within satisfactory limits. Ten of the specimens, equally divided between those having the lower and the higher melting points, gave a faint reaction with ferric chloride, but this is regarded as unimportant, the more particularly since none of the specimens examined yielded any residue on combustion, nor gave reactions for either chloride or sulphate.—Pharm. Ztg., liv (1909), No. 5, 47.

Natural Salicylates—Difficult Identification.—Dr. Geo. R. Pancoast and W. A. Pearson point out some of the difficulties that are encountered in the examination of natural salicylates for admixtures with or substitution by synthetic salicylates—the differences between the two being so slight as to require the closest observation for their recognition. The various methods proposed are briefly reviewed.—Amer. Journ. Pharm., Sept., 1909, 407–410.

Bismuth Salicylate—Examination for Free Salicylic Acid.—Referring to a stricture in the "B. P. Codex" to the effect that "no samples (of bismuth salicylate) will prove the *official* (B. P.) test for salicylic acid, since alcohol causes partial decomposition," and that "it is better to treat the salt with benzene or chloroform, filter carefully, and shake the filtrate with very dilute solution of ferric chloride," J. Bristowe P. Harrison, confirming the first part of this statement, gives reasons for regarding the proposed alternation as being practically worthless. Instead, he recommends the following process which he regards as approaching the ideal, since its merits are enhanced by the fact that the colorations can be used quantitatively: Shake 1 Gm. of the salt with 10 Cc. methylated ether, sp. gr. 0.720, filter, transfer the clear filtrate to a glass dish, and evaporate off the ether on a water-bath, carefully removing the dish as the last traces of ether are passing off. Treat the residue with 0.5 Cc. of cold distilled water, and test with *1 drop* of dilute ferric chloride in the usual way. A

decided violet coloration is thus obtained when 0.01 per cent. of free salicylic acid is present in the sample.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 431–433.

Salicylates—Solubilities.—Dr. Atherton Seidell has determined the solubility of salicylic acid and of the salicylates official in the U. S. P., in alcohol and in water, at a temperature of 25° C. The results are exhibited in the following table, showing the amount of solvent required for one part of the acid and of the respective salts:

PARTS OF SOLVENTS REQUIRED FOR ONE PART OF SALT.

—	In Water.		In Alcohol.	
	Present Results.	U. S. P.	Present Results.	U. S. P.
Salicylate—				
Ammonium	0.97	0.9	2.33	2.0
Lithium	0.786	v. sol.	1.193	v. sol.
Phenyl	6665	2333	4.65	5.0
Quinine	1538	77	20.65	11.0
Sodium	0.867	0.8	7.33	5.5
Strontium	18.85	18.0	48.51	66.0
Salicylic acid	453	308	2.13	2.0

—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem. & Drugg., June 5, 1909, 881.

Bismuth Salicylate—Use of Benzene in Examinations for Free Salicylic Acid.—Since the publication of Mr. Harrison's note advocating the use of ether, sp. gr. 0.720, as a solvent for free salicylic acid in examinations of bismuth salicylate, W. Lyon has examined numerous samples, and compared 0.720 ether with benzene as the solvent to which Mr. Harrison objected. Every sample gave indications of salicylic acid when the solvent, whether it was 0.720 ether or benzene, was evaporated and the residue treated with a drop of dilute solution of ferric chloride, but only in one or two cases did the aqueous solution of the residue do more than faintly redden blue litmus paper. In view of the fact that even a trace of alcohol in the solvent causes a stronger coloration, and the proneness of ethers of commerce to contain traces, Mr. Lyon maintains that benzene should be used, since benzene (90 per cent.) can always be depended on to be free from alcohol. The chloroforms of commerce, on the other hand, are useless for testing bismuth salicylate, since they always contain alcohol.—Pharm. Journ., Jan, 2, 1909, 3.

Bismuth Subsalicylate—Preparation.—Dr. Gunnar Heikel recommends the following method and process for preparing bismuth subsalicylate conforming in characters and composition to the requirements of the U. S. P. Metallic bismuth, or the subnitrate, is dissolved in nitric acid, care be-

ing taken to obtain a concentrated solution with a minimum amount of free acid. Into this an ammonium salicylate solution containing somewhat more than 3 mol. of salicylic acid for one of Bi, is slowly poured with constant stirring. Both solutions have to be cold to avoid a pink coloration due to the oxidation of subsalicylic acid by the ammonium nitrate formed. At first salicylic acid precipitates out in quantity equivalent to the free nitric acid in the bismuth solution, then the unstable bismuth trisalicylate—the ammonium salicylate solution being added until no further precipitate is produced by it in a portion of the filtrate. The precipitate is now collected on a strainer, washed twice or thrice with cold water to remove the bulk of the ammonium nitrate formed, then transferred to a kettle, boiled with water, again strained, and the operation repeated until the filtrate no longer reddens litmus, evidencing that the hydrolysis of the loosely combined bismuth trisalicylate is completed and subsalicylate only remains on the strainer. The dibasic salt or subsalicylate (C_6H_4OH .COO.BiO), so obtained, forms, when dried at a low temperature a perfectly white, bulky powder. The salicylic acid split off may be recovered from the wash water by concentration.—Amer. Journ. Pharm., Dec., 1908, 584–586.

Organic Bismuth Salts—Preparation and Characters.—Hans Telle has studied the compounds formed by bismuth with the more important aliphatic oxyacids, of which those of tartaric and citric acids are the only ones that have heretofore been comprehensively studied. Bismuth hydroxide was first prepared by dissolving bismuth subnitrate in just sufficient cold nitric acid, cooling below 5° C., and pouring the solution into a slight excess of solution of sodium hydroxide. The precipitated bismuth hydroxide was washed first by decantation and subsequently on a filter till free from nitrates; it was then repeatedly pressed between filter paper and finally air-dried. With this the following salts were prepared:

Bismuth Lactate.—Thirty Gm. of the pressed hydroxide shaken with 10 Gm. of water and 30 of lactic acid (specific gravity, 1.21) dissolved; on standing, abundant acicular prisms of bismuth lactate, $BiC_6H_9O_6$, $7H_2O$, were deposited. Washed free from excess of lactic acid, these crystals dissolved in about ten parts of water, the solution becoming turbid when boiled owing to formation and separation of the anhydrous salt which is insoluble.

Bismuth Malate.—This was prepared by boiling 5 Gm. of the bismuth hydroxide with 10 Gm. of malic acid dissolved in a little water; on cooling, sub crystalline bismuth malate, which is insoluble in cold or hot water, was deposited. It has the composition $C_6H_9O_{12}Bi + 3H_2O$.

Bismuth Citrate was obtained by boiling 10 Gm. of freshly precipitated bismuth oxide with 8 Gm. of citric acid dissolved in a little water for five minutes or until a little dissolved completely in ammonia. It has the

formula of bismuth citrate = $C_6H_5O_7BI$.—Arch. d. Pharm., *246* (1908), No. 7, 484–503.

Succinic Acid—Determination in Presence of Fixed Acids.—Emm. Pozzi-Escot recommends the following method for the determination of succinic acid in wines and fermented liquors: A known volume of liquid is neutralized by ammonia and acidified with a slight excess of acetic acid, and then barium chloride is added to precipitate oxalic and mineral acids. The liquid is filtered and the filtrate is boiled; excess of lead acetate is then added to precipitate albuminoids, tannins, etc., which are separated off by filtration. The filtrate is treated with sulphuric acid, then with hydrogen sulphide, filtered and boiled to expel excess of hydrogen sulphide. To separate the malic and succinic acids in the solution it is acidified with sulphuric acid and oxidized with potassium permanganate. The succinic acid remains in the solution, which is boiled; a little potassium bisulphite is added and a large excess of barium chloride to remove the sulphuric acid. The filtered liquid is concentrated, ammonia, alcoholic barium bromide, and three volumes of alcohol are added, and thus barium succinate is precipitated. This is ignited in a muffle, and the barium carbonate determined by titrating with decinormal hydrochloric acid.—Chem. News, Nov. 13, 1908, 245; from Compt. rend., *147* (1908), No. 14.

Tannin—Composition.—At the present time the only available criterion of the purity of tannin consists in the determination of the optical rotation of the sample, it being assumed that a maximum of rotatory power is coincident to a maximum of purity. Iljin has purified the tannin of commerce by different methods, and has so obtained products which showed rotations of $(a)_D = +64.3°$ to $76.5°$, and contained from 53.89 to 54.64 per cent. of carbon and from 3.25 to 3.65 per cent. of hydrogen. The tannin exhibiting the highest rotatory powery, $(a)_D = 76.5°$, and containing 54.02 per cent. C and 3.25 per cent. H, was a preparation obtained by repeated precipitation from its acetic ester-ethyl alcohol solution by chloroform. None of the pure preparations examined by the author, however, corresponded in its composition to the old digallic acid formula.—Pharm. Ztg., liv (1909), No. 45, 442; from Ber. d. D. Chem. Ges., *42* (1909), 1731.

Iron Tannate—Use and Value as a Peroxydase.—E. Stoecklin finds in tanate of iron a body having the property of carrying the oxygen of hydrogen peroxide to a great number of bodies hitherto resistant to the oxidizing action of all the known peroxydases. He prepares the tannate by dissolving the equal weights of tannin and ferric sulphate in water (5 per cent. each) and mixing. The tannate of iron thus obtained forms, on adding to hydrogen peroxide, a most energetic oxidizing body capable of transforming ethyl alcohol into aldehyde, and of oxidizing many phenols.

—Pharm. Journ., May 8, 1909, 611; from Comp. rend., Dec. 28, 1908, 1489.

Tartaric Acid—Litmus Paper as Indicator and How to Use It.—P. Carles finds that sensitive neutral-tint litmus paper affords the most satisfactory indicator for the titration of tartaric acid and its salts. The following method of manipulation gives the best results. According as the standard alkali used is either potassium or sodium hydroxide, a solution of pure neutral potassium tartrate or of Rochelle Salt, 1 : 120, is prepared. Strips of neutral litmus paper are immersed so that half of each piece is beneath the surface of the liquid, the other half being fixed to the side of the containing white porcelain capsule. The submerged portion then assumes a delicate blue shade, which is the neutral tint to be worked to. The tartaric acid or cream of tartar to be tested is dissolved in 100 Cc. of boiling water, and a strip of the same paper is half immersed in the liquid, as above; phenolphthalein is also added, but merely as a rough guide to control the addition of the alkali. The standard alkali is then run in, until the blue shade appears on the litmus paper, similar to that of the control. The liquid is then boiled, and subequently again titrated, using a fresh strip of paper. When the final blue tint is identical with that of the control the reading is made. These minute precautions are necessary, for a small experimental error may affect considerable commercial interests.—Pharm. Journ., May 22, 1909, 697; from Journ. de Pharm. et Chim. *29* (1909), 381.

ORGANIC BASES.

Alkaloidal Standards of the U. S. P. VIII—Modification for the New Revision of the B. P.—J. C. Umney and C. T. Bennett critically review the standards for alkaloidal drugs and their fluidextracts of the U. S. P. VIII, and compare them with the standards now included in the B. P., 1898, with the purpose of reaching standards that may prove suitable for adoption in the proposed edition of the B. P. now in course of revision. Regarding these assay processes the authors offer the following "general remarks":

(1) Aliquot-part methods are not to be recommended, owing to the difficulty of obtaining an accurate proportion of the solvent, especially when it contains water and ether, as powdered drugs are apt to absorb the water. In the case of colchicum the solvent itself is not completely miscible.

(2) In shaking with immiscible solvents, at least three successive quantities should be employed, as two washings are not sufficient to extract all the alkaloid.

(3) Ordinary filter papers should not be used for small quantities of solvents, as loss is inevitable unless a small pressure filter be employed. A plug of cotton wool is better, and is quite sufficient when the alkaloid is to be titrated.

(4) Titration should be conducted with $\frac{N}{20}$ sulphuric acid and $\frac{N}{20}$ sodium hydroxide. Cochineal is the best indicator which can be used almost universally but it is not sensitive enough for $\frac{N}{50}$ solutions.

In their "special remarks" the authors include: Aconite, belladonna, cinchona, coca, colchicum, conium, guarana, hydrastis, hyoscyamus, ipecacuanha, nux vomica, and pilocarpus. The paper includes two tables, the one showing variations found in the alkaloidal content of crude drugs, as compared with the official standard, the other giving a comparison of the U. S. P. standard adopted for fluidextracts and of such as are given in the B. P.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 513–519.

Assay Processes of the U. S. P.—Critical Review.—In a communication read before the "International Congress of Applied Chemistry" (London, 1909), Dr. A. B. Lyons showed how fifteen years ago three drugs were required by leading pharmacopœias to be of a stated standard strength, and to-day twenty more have been added. He reviewed the methods of assay, and said it is reasonable to require that the limit of possible error shall not be greater than perhaps 10 per cent. above or below the ideal standard, and made the following remarks on existing methods:

Opium Assay.—The pharmacopœias are still divided between the lime process, which yields morphine in a reasonably pure form, and the direct precipitation of the concentrated aqueous solution with ammonia, the latter process in its latest form nearly or quite as short as the former and yielding somewhat higher results. He suggested titration of the crude morphine by dissolving first in volumetric potassium hydrate or calcium hydrate, and determining total alkalinity of an aliquot part of the clear solution after impurities have subsided.

Cinchona Assay.—The U. S. P. directions for determining the ether-soluble alkaloids should be amended. Shaking with ether should be continued during ten minutes, at 20° C. (or lower), or not less than thirty minutes should be allowed for separation of the comparatively insoluble alkaloids, the temperature not being allowed to rise above 20° C. The plan of the new Swiss Pharmacopœia for the preliminary extraction of alkaloids—treatment with hydrochloric acid before adding alkali—is very advantageous, and probably equally applicable in many other assays. The use of aliquot parts when volatile solvents are concerned can often be avoided without rendering the assay process much longer or more laborious.

Nux Vomica.—Only the British and the United States Pharmacopœias adopt a strychnine standard for the drug, and the author criticised these briefly.

Aconite.—Titration results are liable to be misleading, since the titration equivalent of aconitine is very high. There should be proof that the alka-

loid present is really aconitine. The result of assay should be checked by the Squibb test. The French Codex gravimetric method, by precipitating the solution with silico-tungstic acid, igniting the precipitate and weighing, may admit of wider application.

Belladonna and Allied Drugs.—The presence in these mydriatic drugs of several alkaloids differing materially in medicinal effects makes results of assays of comparative rather than absolute value. Assays of hyoscyamus, for example, are not to be compared with those of belladonna. This is obvious enough, since one of these drugs certainly cannot be substituted for the other in doses proportioned to the quantity of alkaloid. Neither would it be admissible to fortify a preparation of *Hyoscyamus niger* with *H. muticus*, which is extraordinarily rich in alkaloid (hyoscyamine).

Colchicum.—Present assay-processes are unsatisfactory. Lead subacetate may be used advantageously to obtain the alkaloid in a comparatively pure state. Colchicum corm may be assayed by triturating the powdered drug with a solution of lead subacetate, macerating with warm water, then percolating to exhaustion with warm water, adding sodium phosphate or sodium sulphate to precipitate excess of lead, and shaking out the solution with chloroform. Dr. Gunnar Heikel has lately described an improved method of titrating alkaloids with Mayer's reagent, very rapid and reasonably exact. It is particularly useful in determining colchicine, since that alkaloid cannot be titrated alkalimetrically.

Ipecacuanha.—Most of the assay processes determine ether-soluble alkaloid, either gravimetrically or by titration, using an arbitrary factor based on the assumption that the alkaloid consists of emetine and cephaeline in about equal proportions. It is possibly just as well to determine total alkaloid, preferably perhaps by weight. The indicator is a matter of importance. Hæmatoxylin, which is commonly prescribed, is not at all suitable. Cochineal is much preferable.—Chem. & Drugg., June 5, 1909. 881.

Alkaloidal Assay—New Volumetric Application of Mayer's Reagent.—Dr. Gunnar Heikel observes that, while some 15 or 20 years ago the titration method of making alkaloidal assays with mercuric potassium iodide was popularly employed, at the present time this method is almost forgotten and Mayer's reagent is used only for the detection and isolation of alkaloids. The reason for this abandonment was the difficulty experienced in fixing the end point of the reaction in a direct titration method. The author says, it is well known that to insure complete precipitation requires some excess of the precipitant above the theoretical quantity, there always being a wider or narrower range wherein the precipitate, the precipitant, and the ion to be precipitated are simultaneously present in the system of reaction; or, in other words, all reactions are reversible and continue until equilibrium is reached between the reacting ions. If, however, a certain

excess of precipitant is used, the point of equilibrium is moved as a result of mass action, so that practically none of the ion to be precipitated is in solution; *i. e.*, the precipitation is complete. These and other considerations led the author some time ago to undertake a series of experiments for the purpose of determining by residual titration the amount of Mayer's reagent required for the complete precipitation of 0.100 Gm. of some of the more important alkaloids. In making determinations by this method, the reagent is added at once in such an excess that the precipitation is complete, and then the excess is determined in an aliquot part of the filtrate by estimating the amount of mercury present. Thus mass action is fully eliminated as a disturbing factor, and the amount of reagent actually combined with the alkaloid is accurately determined. The residual mercury is estimated by transforming it into mercuric cyanide, by means of a standardized potassium cyanide solution in excess. The potassium cyanide solution is standardized against a $\frac{N}{20}$ $AgNO_3$ solution in such manner that a certain volume, say 20 Cc. KCN solution, to which 10 Cc. of 10 per cent. ammonia and a few drops of KI solution have been added, require exactly 20 Cc. of $\frac{N}{20}$ $AgNO_3$ to produce the first permanent opaqueness of precipitated silver cyanide. The reaction is as follows: $AgNO_3 + 2KCN = AgCN + KCN$ (soluble double salt) $+ KNO_3$. The first part of the operation, by which the mercury is transformed into the undissociated cyanide, proceeds according to this equation: $HgCl_2 + 2KCN = Hg(CN)_2 + 2KCl$. The Mayer's Solution used ($\frac{N}{20}$) contains 6.775 Gm. $HgCl_2$ and 25 Gm. KI per liter, or exactly 5.00 Gm. metallic mercury per liter, or 0.005 Gm. per Cc. The author's experiments with a large number of alkaloids have proven that with some of the alkaloids the results are not as accurate as might be desirable, while in others they are fairly accurate, and in all cases are of practical value.—Midl. Drugg. and Pharm. Rev., March, April and May, 50–54, 114–120 and 176–181.

Alkaloids—Precautions in Making the Periodide Test.—Among the numerous tests employed to determine the presence of alkaloids, that depending on the formation of the insoluble periodides on the addition of solution of iodine in potassium iodide and water recommends itself on account of its simplicity and general availability. A. H. Clark, however, has recently observed that under certain conditions this test may lead to erroneous conclusions. He found, in the course of some puzzling experimental results, that water saturated with ether and then acidulated gives with iodine solution a reddish-brown precipitate, which, in appearance resembles the reddish-brown precipitate formed when iodine solution is added to a solution of an alkaloid. A saturated solution of ether alone will not precipitate in this manner; neither will acid, or water and acid together. The addition of an equal volume of water at once dissolves the precipitate produced as above explained.—Amer. Journ. Pharm., April, 1909, 176–177.

Japanese Aconitines—Distinctions.—Makoshi has made a chemical investigation of the aconitines of two Japanese aconites, the one designated as "kusauzu", the other as "bushi" tubers, which are said to be derived respectively from *Aconitum Fischeri* and from a variety of the same species. This derivation has now been confirmed by the author. He has named the alkaloid from the "*bushi*" tubers (*i. e.* from the variety of *A. Fischeri*).

Jesaconitine.—This was not obtained in a crystalline condition. On hydrolysis, it yielded benzoic—and anisic acids, together with aconine—the latter identical with the aconine obtained from *A. napellus*, but anisic acid has heretofore not been noted among the hydrolytic products of an aconitine. The tubers, in addition to "jesaconitine," contain another alkaloid which, however, is not described. The alkaloid from the "kusauzu" tubers, which the author names

Japaconitine, is identical with the "japaconitine" of Merck. The melting point is higher than that of the true aconitine (from *A. napellus*); its composition corresponds to the formula $C_{34}H_{47}NO_{11}$.—Pharm. Ztg., liv (1909), No. 45, 442; from Ztschr. Allg. Oester. Ap.-Ver., 1909, No. 20.

Brucine—Pharmacological Action.—With the object of confirming or controverting the generally accepted assumption that the action of brucine is identical in character, though far inferior in potency, with that of strychnine, so that a correct standard for nux vomica and its galenical preparations might be established (see *nux vomica* under "Materia Medica"), R. Wright submitted some brucine, which he had carefully purified, to Dr. W. E. Dixon (a recognized authority in pharmacology) and Dr. W. H. Harvey for experimental investigation, who now report that *the action of brucine far more closely resembles that of methyl-strychnine than strychnine.* They say, that strychnine acts essentially on the sensory cells of the spinal cord, in large doses increasing reflexes to such an extent that convulsions readily follow on the smallest afferent impulse. Death occurs during convulsions from asphyxia caused by the fixation of the respiratory muscles at a time when the necessity of oxygen to the body is very great. With brucine death occurs in an entirely different way. Injections of brucine into mammals cause, first, spasmodic twitching of the muscles like strychnine, but these are never very violent or severe, and quickly pass off. The animal appears to pass into a narcotic condition, and dies from paralysis, and after death all the moter nerves in the body are found to be paralyzed. *Brucine causes death in the same way as curare and methyl-strychnine*, by paralysis of the motor nerve endings. In a table accompanying the paper the authors show the comparative action of strychnine and brucine, as well as of a number of drugs having an action similar to brucine. It remains now to determine the relative toxicity of the two alkaloids upon mammals. Some experiments made have shown that the relative toxicity of strychnine to brucine is as thirty-three to four.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1908, 497–498.

Brucine—Oxidation Product with Permanganate.—In continuation of their studies of the chemistry of the strychnos alkaloids, Hermann Leuchs and Lothar E. Weber obtained by the oxidation of brucine with potassium permanganate in acetone solution,

Brucinonic Acid, $C_{28}H_{24}O_8N_2$, which is found to contain a ketonic oxygen atom, since it yields an oxime and a semicarbazone. The constitution of this acid may therefore be provisionally represented by the formula $C_{17}H_{16}(:N.CO)(:OCH_3)_2(COOH)_2(CO)(:N)$. When reduced with sodium amalgam in faintly acid solution, brucinonic acid takes up two atoms of hydrogen, yielding brucinolic acid, $C_{23}H_{26}O_8N_2$, which is isomeric with dihydro-brucinonic acid; it yields an acetyl derivative, melting point 295° C., and is broken up by caustic soda into glycollic acid and a neutral substance, brucinolon, melting point 282° C., according to the equation—

$$\underset{\text{Brucinolic acid}}{C_{23}H_{26}O_8N_2} + H_2O = \underset{\text{Glycollic acid}}{C_2H_4O_3} + \underset{\text{Brucinolon.}}{C_{21}H_{22}O_5N_2} + H_2O$$

—Pharm. Journ., March 20, 1909, 394; from Berichte, *42* (1909), 770–777.

Brucine and Strychnine—Acid Oxidation Products.—Owing to the susceptibility of brucine and strychnine to the action of oxidizing agents, the yield of oxidation products from the alkaloids has heretofore been small, both in number and in quantity. Herman Leuchs, however, by using potassium permanganate in acetone solution, has been able to obtain in a yield of 25 per cent. two new and well-defined substances, *brucinonic* and *strychninonic acid* of the molecular formulæ $C_{23}H_{24}O_8N_2$ and $C_{21}H_{20}O_6N_2$ respectively, and also, in much smaller yield, their dihydroderivatives, *dihydrobrucinonic acid*, $C_{23}H_{26}O_8N_2$, and *dihydrostrychninonic acid*, $C_{21}H_{22}O_6N_2$. The oxidation of brucine was affected as follows: 27 Gm. of finely powdered potassium permanganate were added during the course of an hour in three portions to a solution of 20 Gm. of brucine in 500 Cc. of acetone cooled to 0° C. The resulting brown precipitate was filtered off, and shaken with 300 Cc. of water, and again filtered. The filtrate was then extracted, once with chloroform to remove any unchanged alkaloid, and then, after acidifying, extracted again. The chloroform solution on evaporation yielded an amorphous brown residue of

Brucinonic Acid, which was purified by crystallization from a mixture of ethyl acetate and water. The acid also crystallizes from water in colorless prisms, which contain an indefinite amount of water of crystallization, and melt at 175°–180° C. When dried at 105° C. the substance contracts at 225° C., and melts with decomposition at 260° C.; it has $[\alpha]_D^{20}$—48.5°. The acid, which is very slightly soluble in ether, toluene or benzene, but readily soluble in acetone, chloroform, or glacial acetic acid, has a bitter taste, and is not poisonous; its *ethyl ester* melts at 130°–132° C.

Dihydrobrucinonic acid, which was obtained by a similar method, employing only half the quantity of potassium permanganate, crystallizes from glacial acetic acid in microscopic needles; it darkens at 300° C., and melts with decomposition at 315° C. (corr.), it is very difficultly soluble in water and most organic solvents. Owing to the slight solubility of strychnine in acetone the oxidation of this substance was carried out at the ordinary temperature, 800 Cc. of acetone being used for 20 Gm. of alkaloid. Proceeding in the same way as described above, a 22–28 per cent. yield of a new acid,

Strychninonic Acid was obtained from strychnine. This new acid crystallizes from water with two molecules of this solvent in obliquely truncated prisms; it dissolves readily in cold alcohol, ethyl acetate, benzene, or acetone, but is precipitated after some time in an insoluble form. The anhydrous acid melts at 259°–261° C. (265°–267° C. corr.) with decomposition, and has $(a)_D^{20} - 43.3$. *Dihydrostrychninonic Acid* remains as an insoluble residue when the crude oxidation product is crystallized from 160 to 170 pts. of water. Owing to its slight solubility it was purified by solution in alkali and reprecipitation with acid; it darkens at 300° C. and melts with decomposition at 315° C. (corr.) and has $[a]_D^{20} + 4.3$. —Pharm. Journ., July 25, 1908, 82; from Berichte, *41* (1908), 1711–1720.

Clavine—Not a Single Body.—In continuation of his researches on clavine (see Proceedings, 1906, 690, and 1907, 929), Vahler finds that, contrary to his original view, it is not a single body, but a mixture of leucine (*a*-aminoisobutylacetic acid) and a basic body having the empirical formula $C_5H_{11}O_2N$.—Pharm. Ztg., liv (1909), No. 4, 38; from Arch. f. Exp. Pathol. u. Pharmacol., *60*, p. 42.

Codeine, B. P.—Modification of Characters and Tests.—D. B. Dott suggests the following revision and amplification of the characters and tests of codeine: Describe the alkaloid as forming octahedral prisms; the solubility of 1 to 30 of ether may be correct for the alcoholic ether of sp. gr. 0.735, but for pure ether is nearer 1.50. Instead of "readily soluble" in alcohol (90 per cent.), it is better to state quantities: 1 in 1.3 parts or 1 Gm. in 1.6 Cc. In chloroform, the solubility is approximately 1 :1. The melting point should be corrected to 156° C. The best color test, probably, and one more useful than that now given, consists in warming with sulphuric acid containing a minute portion of sodium arsenate, whereupon a strong blue color is developed.—Pharm. Journ., Aug. 1, 1908, 108.

Codeine Hydrobromide—Insolubility in Presence of Halogen Salts of the Alkalies.—Fritz Rachel, having observed the formation of a crystalline precipitate in a prescription of 0.4 Gm. codeine phosphate, 10.0 Gm. sodium bromide and 150.0 Gm. distilled water, which redissolved on heating but was again deposited on cooling, identified the precipitate to be

codeine hydrobromide, $C_{18}H_{21}NO_3.HBr + 2H_2O$. Further experiments demonstrated that pure codeine hydrobromide, which is according to Dott soluble in 82.5 parts of cold water, is deposited unchanged from its solution on addition of a sufficient excess of sodium bromide.—Pharm. Zentralh., xlix (1908), No. 51, 1034.

Corynine (Yohimbine)—Effect on the Generative Organs.—Drs. W. Cramer and F. H. A. Marshall find that corynine (or yohimbine) has a marked action on the female generative organs, including the ovaries and mammary glands, producing both growth and congestion, and inducing a condition resembling normal "heat." The experiments tend to confirm the reports of veterinarians in Germany and elsewhere that corynine is an effective remedy for certain forms of sterility.—Pharm. Journ., Aug. 29, 1908, 236.

α- and β-Eucaine—Distinguishing Test.—According to Candussio the following reaction serves well for distinguishing α- and β-eucaine from each other: If 2 drops of a solution of iodine in potassium iodide (0.5 I, 1.0 KI, 10.0 water) are added to 2 Cc. of a 1 per cent. solution of β-eucaine, a brown mixture results, and in 1–2 hours a small brown precipitate forms, leaving the supernatant solution clear. If the experiment is then repeated with α-eucaine, a red-brown precipitate is immediately formed, and this changes in 1–2 hours to an orange color.—Pharm. Ztg., liii (1908), No. 89, 879; from Pharm. Post, 1908, No. 82.

Gelsemium Alkaloids.—L. E. Sayre contributes a further study of the alkaloids of gelsemium, in continuation of his previous paper published in the Proceedings, 1907, 205. See Proceedings, 1908, 851–859.

Hordenine—An Alkaloid from Germinating Barley.—M. E. Léger describes "hordenine," an alkaloid obtained from barley in the process of malting. It is in the form of orthorhombic crystals, fusible at 117.80° C., and acts as an energetic base, reducing potassium permanganate and iodic acid, but resists caustic potash. Hordenine is *p*-oxy-phenyl-ethyl-dimethyl amine, $C_{10}H_{15}NO$, this having been established by many experiments. It gives with acids, such as hydrochloric and sulphuric, crystalline salts, and phenol derivatives, such as benzoyl hordenine, have been prepared. It is similar in action to Gautier's tyrosine. In medicine it is used in hyperchlorhydrosis, enteritis, diarrhœas, dysentery and cholera.—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem. & Drugg., June 5, 1909, 873.

Hydrastine Estimation.—Frank R. Eldred and C. M. Pence communicate some notes on the estimation of hydrastine in the "Proceedings" of this Association, 1908, 836–838.

Isocalycanthine is the subject of a third paper on the alkaloids of *Calycanthus glaucus* by H. M. Gordin in the "Proceedings" of this Association, 1908, 805–811.

Morphine—Forensic Determination as Dehydromorphine (Oxydimorphine, Pseudomorphine).—Reichardt calls attention to the liability of morphine being converted in the organism into dehydromorphine, and that this conversion may under circumstances lead to error in forensic determinations, since a mixture of the two bases gives different reactions from the reactions characterizing the individual substances. It is important, therefore, to assure the identity of the two bases, to which end a method for their separation, possibly based on the ready solubility of dehydromorphine and its salts in organic solvents, may be available. The author suggests also that the estimation of morphine, when both alkaloids are present in sufficient quantities to interfere with the reaction, may be accomplished by difference possibly, by converting the morphine with hydrogen dioxide into dehydromorphine, a method which, however, requires further study and experimentation.—Pharm. Zentralh., xlix (1908), No. 47, 951–954.

Morphine and Oxydimorphine—New Reagent for their Identification.—Hashida finds a freshly prepared mixture of 0.15 Gm. sodium molybdate, 10 drops formalin (35 per cent.), and 30 Cc. conc. sulphuric acid, to be an excellent reagent for distinguishing morphine and oxydimorphine from each other. With oxydimorphine the reagent gives a violet color, rapidly changing to a stable blue-green, but disappearing upon the addition of water, while the violet color at first produced with morphine gradually changes to a blue-violet and finally to a dirty green color. The reaction is quite sensitive.—Pharm. Ztg., liii (1908), No. 72, 702; from Journ. d. Pharm. Gesellsch. v. Japan, July, 1908.

Apomorphine Hydrochloride—Constituent Water.—Although apomorphine hydrochloride is uniformly described as being an anhydrous compound, the investigations of Professor Ernst Schmidt, extending over a number of years, prove that this salt uniformly contains water, amounting on an average to 3.76 per cent. When completely dried and again exposed to the air, the salt rapidly absorbs the water again.—Apoth.-Ztg., xxiii (1908), No. 73, 657.

Apomorphine Hydrochloride—Chemical Formula.—Referring to the preceding observations of E. Schmidt, D. B. Dott gives an account of some experiments undertaken to ascertain the correct chemical formula of apomorphine hydrochloride. A sample of the hydrochloride was recrystallized from hot water, rendered distinctly acid; the salt was well drained, and dried at ordinary temperature. The hydrochloride so obtained lost 5.21 per cent. in the water-bath, and by precipitation with silver nitrate, nitric acid being added after precipitating, the average HCl calculated from the silver chloride was 11.08 per cent. on the air-dry salt and 11.68 per cent. on the salt dried in water-bath. These numbers agree with the formula $C_{34}H_{36}N_2O_52HCl.2H_2O$, which the author considers more

probable than that originally ascribed, since it requires 5.44 per cent. of water and 11.04 per cent. HCl.—Pharm. Journ., Dec. 19, 1908, 801.

Ethylmorphine Iodide is recommended by Dr. Bruno Sylla as a substitute for "Dionin," for the treatment of eye affections. Its application has the advantage of being practically painless, producing only a mild, transient. burning sensation. On account of its sparing solubility in water (about 4 per cent.) it is advantageously applied as dusting powder.—Pharm. Zentralh., l (1909), No. 7, 130; from Wschr. f. Therap. u. Hygiene d. Auges, (1909).

Nicotine—Determination as Silicotungstate.—G. Bertrand and M. Javillier find that nicotine, especially when present in very small quantities, can be accurately determined by the following method, which is based on the precipitation of the alkaloid as silicotungstate: 12 Gm. of tobacco are boiled for thirty minutes with 300 Cc. of 0.5 per cent. hydrochloric acid in a flask provided with a reflux condenser. 250 Cc. of the centrifuged or filtered liquid (= 10 Gm. of tobacco) is precipitated with a 10 or 20 per cent. solution of potassium silicotungstate. The precipitate is collected by centrifugation (preferably after standing twenty-four hours), washed in water acidulated with hydrochloric acid and containing a few drops of the precipitant, and transferred to small (125 Cc.) flask provided with a very long neck. Calcined magnesia is now added and the liquid distilled in a current of steam, taking care that its volume is gradually reduced to a few Cc. The distillate is then titrated with sulphuric acid, and of such strength that 1 Cc. indicates 0.010 Gm. of nicotine (3.024 H_2SO_4 per liter).

Nicotine Silicotungstate crystallizes in lamellæ having the composition $12TuO_3SiO_22H_2O$, $2C_{10}H_{14}N_2 + 5H_2O$. All the moisture is driven off by drying for one hour at 120° C. Solution of potassium silicotungstate is a very delicate reagent for nicotine and produces a cloudiness in solutions as dilute as 1 in 300,000 in the presence of 0.1 per cent. of (strong) hydrochloric acid.—Pharm. Journ., Febr. 27, 1909, 273; from Bull. de Sci. Pharm., *16*, 7.

Protopine — A Constituent of Japanese Corydalis Tubers.—Dr. K. Makoshi has examined two crude alkaloids isolated by Professor Uyeno from Japanese corydalis tubers (*Corydalis vernyi*) by the process employed by E. Schmidt in his investigation of the tubers of *Corydalis cava* (see Proceedings, 1907, 796). The one, alkaloid *A*, was obtained from the extract by shaking out its alkaline solution with ether; the second, alkaloid *B*, was obtained by shaking out the residual extract with chloroform after shaking out with ether—the yields being respectively 0.13 per cent. and 0.013 per cent. Dr. Makoshi identified alkaloid *A*, after repeated crystallization from chloroform-alcohol, to be identical with *protopine*, the typical forms and reactions of which he succeeded in reproducing. Alka-

loid *B* formed a yellow, crystalline mass, which closely resembled in its physical and chemical characters *dehydrocorydaline*, but was not in sufficient quantity to enable a more definite identification.—Arch. d. Pharm., *246* (Sept. 16, 1908), No. 6, 401.

Quinine Compounds—Standardization.—D. Lloyd Howard, Bernard T. Howard and O. Chick contributed a paper to the International Congress of Applied Chemistry, embracing a comparison of some official tests of quinine sulphate. The authors pointed out that while the B. P. test is based on the gravimetric method of Dr. Paul, the other official tests used are based on the volumetric method of Professor Kerner; these tests are those of the P. G. IV., P. G. II, B. P. Codex (1907), U. S. P. (1905) as subsequently modified, Codex Fr. (1884), and Codex Fr. (1908). Each of these methods was tried by two investigators working independently on each of five samples of quinine sulphate of different qualities, ranging from a sample passing the P. G. IV. (and consequently all the other tests), and containing no cinchonidine, to a sample just passing the P. G. II. (and none of the more severe tests), and containing 6.8 per cent. of cinchonidine (alkaloid). A table of results was included, which showed the very remarkable influence of the "personal equation," for while each investigator adhered strictly to the directions officially given, and obtained results generally in accordance *with each other*, these results often differed widely from those of the other investigator. All these tests are empirical, and do not afford a means of estimating accurately the amount of alkaloids other than quinine present. The method of Paul indicates only cinchonidine and cinchonine. The method of Kerner indicates other alkaloids —notably the little-known hydroquinone—and it would be well to determine the relative importance of these various impurities, and also whether the advantage to the consumer of a very high standard, such as the P. G. IV, repays the largely increased cost. The authors laid special stress on the necessity in this country of an official test which does not require exceptional manipulative skill, and also of directions for carrying out the test so full and explicit as to enable investigators to obtain similar results and eliminate as far as possible the influence of the "personal equation."—Chem. & Drugg., June 5, 1909, 880.

Quinine—Questionable Reliability of Duncan's Method of Estimation in Cinchona Bark.—Referring to the observation of Duncan (see abstract, p. 382) that the insolubility of quinine sulphate in 10 per cent. solution of sodium sulphate may be utilized for the estimation of that alkaloid in cinchona barks, N. H. Cohen, on the basis of experiments recorded, expresses the opinion that the method of Duncan cannot be used for this purpose. Perhaps the method can be of some utility if the pharmacist wishes to separate the greater part of quinine contained in the total alkaloid of the bark, or extract it in cases where it is not necessary to obtain

the substance quite pure, and it will thus give him *a rough idea* of the quinine content of the drug.—Pharm. Journ., May 22, 1909, 670.

Quinine—Modification of the G. Ph. IV Method of Estimation in the Tannate and Ferro-Citrate.—In order to overcome the difficulties encountered in the separation of the ethereal solution from the aqueous portion during the shaking-out process directed in the G. P. IV for the estimation of quinine in the tannate and ferro-citrate, E. Rupp and W. Calliess recommend that an aliquot part of the ether solution be siphoned off and evaporated. It is necessary, however, to take into calculation the reduction of the ether layer by solution in the aqueous alkaline solution. The authors have determined that 30 Gm. are reduced in the amount of about 1 Gm. by 10 Gm. of normal alkali or of a mixture of 5 Gm. of water and 5 Gm. of 15 per cent. soda solution. If liquor kalii carbonici instead of soda solution is used, no diminution of volume occurs. As applied to quinine tannate, the process is to be conducted as follows: 1.2 Gm. of the tannate and 10 Gm. liq. kal. carbon. (Ph. G. IV) are shaken together in a 75 Cc. bottle, 30 Gm. of ether added, and the mixture well shaken several minutes. Then 0.5 Gm. tragacanth is added and the mixture again shaken vigorously one minute. It is allowed to stand five minutes, and 25.3 Gm. of the ethereal solution, corresponding to 1 Gm. of tannate, is decanted and evaporated. The dried residue should weigh not less than 0.3 Gm.—Apoth.-Ztg., xxiv (1909), No. 18, 159.

Quinine—Insolubility of the Neutral Sulphate in 10 per cent. Sodium Sulphate.—William Duncan makes the interesting observation that neutral quinine sulphate is precipitated from its aqueous solutions by the addition of sufficient sodium sulphate to make a 10 per cent. solution. In the experiment recorded, 1.0 Gm. of anhydrous purified quinine sulphate was dissolved in 1000 Cc. of water, and to 100 Cc. of this solution 10.0 Gm. of sodium sulphate were added and dissolved. In the course of a few minutes separation of the alkaloid began. The mixture was set aside for twenty-four hours to complete the crystallization, filtered, and the filtrate examined. The thalleioquin reaction was obtained faintly. Evidently the quinine sulphate had been practically all precipitated. The experiment was repeated on a liter of the same strength, the crystals collected on counterpoised filters, washed with quinine-sulphate-saturated water, dried and weighed. 0.9642 Gm. was obtained from the original gramme of alkaloid used. That is to say, 10 per cent. of sodium sulphate reduced the solubility of quinine sulphate in water to less than 1 in 28,000, or about 1 grain in 3 pints, and this can be further reduced by increasing the sodium sulphate. It may be stated, however, that during this special precipitation the temperature of the laboratory was low—never above 3° C. The test has been repeated at temperatures varying from 0° C. to 16.5° C., and it has been found, as expected, the higher the temperature the greater the loss.

On the other hand, the aqueous solutions of the neutral sulphates of the other cinchona alkaloids—quinidine, cinchonine and cinchonidine—are not affected by the sodium sulphate. They are retained in the solution of a mixture of this sulphate, whilst the quinine sulphate is completely salted out. The author is of opinion that a practical method for the direct estimation of quinine in cinchona barks became a possibility by applying the observations made to the assay process.—Pharm. Journ., March 27, 1909, 429.

Quinine—Determination in Pills.—W. Lenz recommends the following method for determining the quinine in pills: Ten pills are placed in a small but stout porcelain dish with 5 Cc. each of diluted sulphuric acid and water, and the covered dish is allowed to stand at a temperature of about 50° C. until the pills are disintegrated, a process which may be hastened by means of a pestle-like glass rod. The pill-magma is stirred unt uniform, 10 per cent. of water being added, and the dish is heated a quarter of an hour on a boiling water-bath. The mixture is then transferred to a plain filter, 8 Cm. in diameter and washed with hot water as long as the filtrate gives evidence of quinine by its fluorescence—from 70 to 90 Cc. collected in a 100 C. flask, being usually sufficient. When cooled sufficiently the filtrate is adjusted with water to 100 Cc., the quinine in it is determined by one of two methods described by the author, of which the following commends itself on account of its simplicity: 25 Cc. of the filtrate are shaken in a tall glass-stoppered cylinder with 10 Cc. of solution of sodium hydroxide and 50 Cc. of ether.; as soon as two layers are found on standing. 40 Cc. of the ether solution are decanted in a pipette and evaporated to constant weight at 100° C. The result gives the weight of pure quinine in two pills.—Apoth. Ztg., xxiv (1909), No. 40, 336.

Solanine—Extraction from Potato Sprouts and Flowers.—A. Colombano has obtained 2.5 per cent. of crude solanine from potato sprouts and as much as 6 to 7 per cent. from the flowers. It was extracted by macerating the fresh material with dilute sulphuric acid, then liberated by alkali; subsequently purified by treatment with alcohol, and finally recrystallized from alcohol 80 per cent. When dried *in vacuo* at 105° C., this gave analytical figures corresponding to the formula $C_{32}H_{51}O_{11}N$. It forms fine, silky needles, which discolor at 245° C., turn brown at 255° C., commence to melt at 260° C., and are completely melted, with decomposition at 262–293° C. When hydrolyzed it yields a solanidine with the melting point 210–215° C. The author has previously (1905), in conjunction with Oddo, shown that the solanine from *Solanum sodomæum* differs from the solanine obtained from *S. tuberosum:* The solanine from the former yielding on hydrolysis a *solanidine* which melts at 190° to 192° C.—Pharm. Journ., July 4 and 18, 1908, 8 and 56; from Gazz. Chim. Ital., 1908, 19, through Journ. de Pharm. et Chim., *27* (1908), 443 and Rep. de Pharm., 1908, 272.

Solanine—Proportion in Potatoes Under Various Conditions.—M. von Morgenstern has determined the proportion of solanine in potatoes under various conditions. The highest proportion of solanine found in ordinary potatoes is 0.0125 per cent. Those used for feeding cattle contain 0.0115 per cent., while others used as ordinary fodder gave only 0.0058 per cent. Yellow potatoes contain 0.078 per cent., considerably more than red, 0.0119 per cent. A sandy soil gives a crop containing 0.011 per cent., and one rich in humus but 0.0076 per cent. Grown in dry sandy soil they yielded 0.0156 per cent., and in dry humus 0.0045 per cent. Tubers which had been injured and become cicatrized in the soil contain more solanine than those which are uninjured. But if the injured potatoes are exposed to the air, so that they become mouldy, the amount of alkaloid undergoes a very marked diminution. Disease does not appear to affect the amount of solanine, nor does putrefaction; exposure to light sensibly increases it; storing does not affect it. Solanine is formed from the leaves. It is produced in greater quantity at the time of sprouting, and passes into the shoots, where it accumulates in the growing points. Although the base serves as a protection for the young growing portions of the plant, it also acts in retarding the diosmosis of the sugar formed by assimilation.—Pharm. Zentralh., liv (1909), No. 1, 14; from Südd. Apoth. Ztg., 1908, 384.

Sparteïne—Conversion of a-Methylsparteïne into Isosparteïne.—Armand Valeur has shown experimentally that by boiling a solution of *a*-methylsparteïne in dilute sulphuric acid until potassium permanganate is only very slightly reduced, and adding barium iodide, the sulphate of *a*-methylsparteïne isomerizes, giving isosparteïne sulphomethylate, which can be isolated by slow evaporation in vacuo. The analogy between sparteïne and N-methylpiperidine is complete. N-methylpiperidine when subjected to Hoffmann's reaction is transformed into an unsaturated base, N-dimethylpiperidine, the chlorhydrate of which forms the cyclic compound dimethylpyrrolidine chlormethylate; the ammonium hydrate corresponding to this last salt is decomposed, regenerating N-dimethylpiperidine. Similarly sparteïne by reactions of the same type yields *a*-methylsparteïne, isosparteïne, iodomethylate and (by Hoffmann's method) *a*-methylsparteïne.—Chem. News, Aug. 21, 1908, 96; from Compt. rend., *147* (1908), No. 2.

Theobromine—New Quantitative Method of Determination in Cacao.—In the course of his investigation on the determination of the fat in cacao by the aid of chloral alcoholate (see *Cacao* under "Materia Medica"), Ad. Krentz made the observation that some of the theobromine is associated with the fat. In continuation of his studies, he now finds that this portion consists of the free theobromine content of the cacao, while the remainder of theobromine content, which exists in glucoside-like com-

bination (confirming the view of Hilger that theobromine exists in two forms), does not enter into solution until it has been liberated by hydrolysis with sulphuric acid. Upon these observations the author bases a new quantitative method for the estimation of the theobromine content of cacao, which in brevity may be here described as follows: About 1.5 to 2 Gm. of cacao are melted in an Erlenmeyer flask with 3 Gm. of chloral alcoholate on a boiling water-bath until a homogeneous mass results. This, while still hot, is extracted with ether, using small portions at a time (requiring in all about 40 to 50 Cc., and the ether and alcoholate are then distilled off in a tared fractionation flask, towards the end under diminished pressure. The residue dried at 100°–105° C., is weighed, then extracted with cold carbon tetrachloride, and again weighed—the difference in the two weighings giving the quantity of *free* theobromine in the sample. The residual cacao on the filter, remaining after extraction with ether, is now returned to the original flask and heated ¾ hours with 50 Cc. of 4 per cent. sulphuric acid under a reflux condenser; then, while hot, it is transferred to a beaker, neutralized with barium carbonate in excess, evaporated to dryness, powdered, mixed with washed sand, and soxhleted 5 hours with chloroform. The pure white mass remaining after distilling off the chloroform consists of the "glucosidal" theobromine originally present in the sample.—Schweiz. Wschr. f. Chem. u. Pharm., xlvii (1909), No. 4, 48–49; from Ztschr. f. Unters. d. Nahr.-u. Genussm., xvi (1908), No. 10, 579–584.

Theocine—Volumetric Estimation in its Preparations.—Kockum recommends the following volumetric method for the estimation of theocine in its preparations: Dissolve 1 Gm. of the preparation in water and adjust the solution to 100 Cc. Dilute 10 Cc. of this solution with 50 Cc. of water in a porcelain dish, add 3 drops of potassium chromate, heat a few minutes in the water-bath and, continuing the heating, titrate with $\frac{N}{10}$ silver nitrate V. S. To prevent heating of the contents of the burette, a disc of pasteboard or glass, perforated with a hole through which the point of the burette passes, is interposed over the surface of the heated liquid. 1 Cc. of $\frac{N}{10}$ silver nitrate V. S. corresponding to 0.018 Gm. of theocine.—Pharm. Ztg., liv (1909), No. 11, 106; from Svensk. Farm. Tidskr., 1908, No. 5.

Tropacocaine—Preparation of Sterile Solutions.—Because of the less toxic action, tropacocaine is rapidly replacing cocaine in ocular, dental and general surgical work for producing local anaesthesia. Clarissa M. Roehr says that the solutions, which vary from 3 per cent. to 10 per cent., are prepared with sterile water containing 0.6 per cent. sodium chloride, and that these solutions are much more stable than cocaine solutions, keeping well, and are easily sterilized by boiling without decomposition. For this purpose the tropacocaine is supplied in sterile, sealed glass tubes containing 60 Mgm. in dry powder. When required for use the end of

the tube is broken off and the necessary quantity of sterilized saline solution introduced with a syringe, solution being quickly effected.—Pacific Pharm., June, 1909, 38.

Aniline—Reaction with Arsenic Acid.—Benda finds that when aniline and arsenic acid are heated together at 170°–200° C., *p-diaminodiphenylarsenic acid* is formed, along with *p-aminophenylarsinic acid.* The two acids are separable from each other by taking advantage of the difference in the solubility of their sodium salts, the second acid being very much more soluble and therefore obtainable from the mother liquor remaining after the crystallization of the primary acid.—Pharm. Ztg., liii (1908), No. 81, 797; from Ber. d. D. Chem. Ges., *41* (1908), 2367.

Aniline Red—Adulteration With Crystals of Cane Sugar.—George D. Beal having occasion to make an alcoholic solution of commercial aniline red, or fuchsine, which had been found perfectly soluble in water, found it to be only partially soluble in the alcohol. On examination, the insoluble portion proved to be simply cane sugar, in somewhat larger crystals than the common granulated sugar, with a thin coating of the aniline dye.

On discussing the subject with a jobber, the author was informed that this method of adulterating common aniline red was quite general.—Proc. Ohio State Pharm. Assoc., 1908, 63.

In the course of discussing the above paper, Professor Feil mentions that one of the commonest adulterants is Glauber's salt to-day.—Ibid.

Methyl-Red—A New Indicator of Extreme Delicacy.—E. Rupp and R. Loose describe a new indicator, which, is an azo combination of *o-amido benzoic acid and dimethylaniline*, and is conveniently called methyl-red. It acts sharply in use with $\frac{N}{0\,1\,0}$ solutions, and for this purpose a 0.2 per cent. solutions is used. In alkaline and neutral solutions it has a pale-yellow color, in acid solutions a violet-red. It may be prepared by dissolving 5 Gm. of *o*-amido benzoic acid in about 100 Cc. of alcohol, and adding 23 Cc. of concentrated hydrochloric acid, the liquid being cooled. It is then diazotised with a solution of 2.5 Gm. of sodium nitrite in a little water. and combined with 4.65 Gm. of freshly distilled, technical dimethylaniline, which has been dissolved in 25 Cc. of alcohol and about 5 Cc. of hydrochloric acid. The whole is heated for half an hour on the water-bath, and then poured into water. The separated azo coloring matter is collected, pressed, and taken up with hot glacial acetic acid. To the boiling solution water is added until turbidity occurs, when, on cooling, the coloring substance crystallizes out in glistening violet needles. It is readily soluble in glacial acetic acid, moderately soluble in alcohol, and nearly insoluble in water. The empirical formula is $C_{15}H_{15}N_3O_2$.—Pharm. Journ., Jan. 2, 1908, 6; from Berichte, *41* (1908), 3095.

Acetanilide, Acetphenetidin and Acetyl-Morphine—Estimation in Mixtures.—Referring to the method suggested by Joseph L. Turner and

Charles E. Vanderkleed for the estimation of acetanilide and phenacetin in pharmaceutical mixture (see Proceedings, 1907, 934), Edward S. Rose and Maxwell M. Becker call attention to a method worked out by them, which depends on a direct saponification with a non-volatile acid, distillation in a current of steam, and subsequent titration of the distillate with standard alkali. The scheme, as carried out by the authors, required only about 1½ hours for completion, after the extraction of the chemical, whereas the method above referred to requires 5 to 8 hours. Moreover, it is seemingly directly applicable to all compounds containing the acetyl radical in the absence of other acid radicals or salts of volatile acids, and the favorable results which were obtained with acetanilide, phenacetin, and heroin, lead the authors to recommend the method, the details of which must be consulted in the original, as being worthy of further consideration. —Proc. Penna. Pharm. Assoc., 1908, 271–274.

Amidopyrine (Pyramidon)—Action of Hydriodic Acid and of Iodine.—Having found that "pyroïdone" (which see under "New Remedies") was merely a solution of amidopyrine hydriodide containing excess of the base, H. Consin directed his attention to the action of hydriodic acid on amidopyrine. It was found that when equal molecular proportions of amidopyrine and hydriodic acid were evaporated together to dryness and the residue obtained was recrystallized from boiling alcohol, 95 per cent., to which a few drops of sulphurous acid were added, the small white crystals were amidopyrine hydriodide, $C_{13}H_{17}N_3OHI$. Larger crystals were obtained by adding ether to a solution of the salt in absolute alcohol. This salt is very soluble in water; on exposure to air the solutions soon become yellow, and the crystals themselves become colored on exposure to moist air. Their melting point is not sharp; towards 200° C. they decompose. No other compound but this salt resulted when the base was treated with other proportions of hydriodic acid. When this hydriodide is treated with iodine in the proportion of two atoms of the latter to one of the salt, a precipitate composed of fine, brown needles is obtained having the composition $C_{13}H_{17}NO_3HI.I_2$. The same diodo-hydriodide results when one molecule of the free base is treated with three atoms of iodine in the presence of alcohol.—Pharm. Journ., Feb. 20, 1909, 222; from Journ. de Pharm. et Chim., *29* (1909), 49.

Hexamethylenamine—Determination in Galenical Mixtures.—The determination of hexamethylenamine in pharmaceutical mixture is conveniently accomplished according to Puckner and Hilpert as follows: The mixture is boiled with solution of potassium hydroxide, which drives off all ammonia but does not affect the hexamethylenamine. It is then boiled with diluted sulphuric acid, which splits up the amine, and on now boiling the mixture with KHO, ammonia distils over and may be determined by titration.—Journ. Amer. Chem. Soc., xxx (1908), 1471.

Hexamethylenamine—Method of Quantitative Determination.—Linwood A. Brown and B. F. Otter publish the details of an extensive series of experiments, undertaken with the object of working out a reliable method for the quantitative estimation of hexamethylenamine, either alone or in admixture. Their results demonstrate that this substance can be estimated quantitatively, within a reasonable degree of accuracy, provided volatile acids are not present, by hydrolyzing it, forming NH_3 and CH_2O, and estimating either the one or the other, or both. Furthermore, they found that the H_2O_2 method of oxidizing the formaldehyde (CH_2O) to formic acid gave the best results of any of the methods tried, if the mixture is allowed to stand 24 hours at room temperature, or if heated on a water-bath for about 3 hours.—Merck's Rep., Oct., 1908, 257–260.

Brom-Acetamide—A Derivative of Hypobromic Acid.—Having previously expressed the opinion that brom-acetamide, which was first prepared by Hoffmann, is a derivative of hypobromic acid, François now, in continuation of his investigation, furnishes additional confirmative evidence of the correctness of his view. The brom-acetamide hydrate of Hoffmann must be regarded as having the composition $CH_3—CONH_2.BrOH$. This body may be obtained by the evaporation of a solution of hypobromic acid and acetamide. The body $CH_3—CO—NHBr$, obtained from this by drying at 50° C. is according to the opinion of the author to be regarded as the amide of hypobromic acid.—Pharm. Ztg., liv (1909), No. 19, 187; from Journ. de Pharm. et Chim., 1909, No. 4.

Phenolphthalein—Determination in Pharmaceutical Preparations.—Kollo recommends a method for the determination of phenolphthalein which depends on its precipitation as tetraiodide. A quantity of the substance containing approximately 0.4 to 0.6 Gm. of phenolphthalein is comminuted and percolated with an 8 per cent. solution of NaOH until the percolate passes colorless, which is collected in an Erlenmeyer flask. A solution of 2 Gm. iodine and 3 Gm. potassium iodide in 20 Cc. of water is now added, whereby the color of the percolate changes from red through blue to yellow; upon acidulation with concentrated hydrochloric acid, tetraiodphenolphthalein is precipitated. This is washed with water, alcohol and ether, dried at 100° C., and weighed. The precipitation may more conveniently be effected in a wide test tube, and the precipitate washed and dried by the aid of centrifugation. 1 Gm. of tetraiodide so obtained corresponds to 0.3869 Gm. of phenolphthalein.—Pharm. Ztg., liv (1909), No. 35, 345; from Pharm. Praxis, 1908, No. 8.

Salipyrine—Not a Chemical Compound.—From the observation that salipyrine exhibits in its solubilities and reactions, the individual behavior and the characteristics of its components, Denis concludes that salipyrine is not a definite chemical compound but simply a mixture of antipyrine and salicylic acid, and recommends that in a new edition of the Belgian

Pharmacopœia the following method for its preparation be adopted: Salipyrine is to be prepared by the admixture of equal parts of antipyrine and salicylic acid.—Pharm. Ztg., liii (1908), No. 98, 971; from Journ. de Pharm., 1908, No. 20.

Glucosides and Neutral Principles.

Glucosides—Testing Vegetable Products by Means of Emulsin.—Prof. E. Bourquelot recommends a method of testing for glucosides in vegetable products, which depends upon the fact that the glucosides hydrolizable by emulsin are lævo-rotatory and derivatives of *d*-glucose. By hydrolsyis a body is obtained, which is dextro-rotatory, owing to the production of the *d*-glucose and other substances which are without action in the plane of polarized light. It follows that to test for one of these glucosides in an aqueous solution of vegetable origin all that is necessary is to add in a convenient manner a little emulsin in solution. If under the influence of the enzyme the body splits off and gives a dextro-derivative, the solution in question contains one of these glucosides. The method is simple, but it is necessary to take the precautions outlined in a previous work of the author in 1907 (see Proceedings, 1908, 406). By the process mentioned the following glucosides have been discovered: Aucubene (1902); sambunigrin (1905); prulaurasin (1905); tanricatin (1906); jasmiflorin (1906); bakankosin (1907); verbenalin (1908); oleuropin (1908); and erytaurin (1908).—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem, & Drugg., June 5, 1909, 882.

Glucosides.—Preservation from decomposition during the preparation of *Solid Extracts*, which see under "Pharmacy."

Cyanhydric Glucosides—Enumeration.—Prof. E. Bourquelot reviews the subject of cyanhydric glucosides, and enumerates these as follows, with the dates of their discovery: Amygdalin (1830), linamarin (1891), phaseolunatin (1903), amygdonitrile glucoside (by incomplete hydrolysis of amygdalin), lotusin (1900), dhurrhin or sorghum glucoside (1903), karakin and corynocarpin (1903), legynocardin (1904), iso-amygdalin (1904), sambunigrin (1905), prulaurasin (1905), vicienin (1906). Examples are given of the products produced on decomposition—linamarin and phaseolunatin, for instance, giving acetone.—Proc. Intern. Congress of Appl. Chem. (London, 1909), in Chem. & Drugg., June 5, 1909, 882.

Cyanogenetic Glucosides—Occurrence in Various Plants of the Juncaginaceæ.—M. Greshoff finds that *Triglochin maritima*, *Triglochin palustris* and *Scheuchzeria palustris*, acquatic plants belonging to the Juncaginaceæ, yield distillates containing hydrocyanic acid and acetone. This leads to the inference that one or more glucosides allied to "Linamarin" (see Phaseolunatin) is present in these plants, although not yet isolated.—Pharm. Journ., Dec. 26, 1908, 840; from. Pharm. Weekbl., *45* (1908), 1165.

Cyanogenetic Glucosides—Additional List of Plants Containing Them.—In addition to those plants which have already been found to yield hydrocyanic acid when infusions of the fresh organs are treated with emulsin, the following are enumerated by E. Couperot: Graminaceæ: *Briza minor, Catabrosa aquatica, Lamarckia aurea, Stirpa tortilis, Sorghum nigrum, Holcus lanatus, Poa pratensis, Festuca poa.* Compositæ: *Aplotaxis candicans, Centaurea montana, C. solstitialis, Dimorphothecia pluvialis* and *Circium arvense.* By inference, these plants contain one or more cyanogenetic glucosides.—Pharm. Journ., Jan. 16, 1909, 60; from Journ. de Pharm. et Chim., *28* (1908), 542.

Cyanogenetic Glucosides—Metamorphosis During Germination.—From experiments conducted by L. Guignard with Javanese *Phaseolus lunatus* beans, it seems that there is a progressive destruction of phaseolunatin during germination up to a certain point, but even in etiolated plants, grown in the dark, a considerable amount of the glucoside is regenerated as soon as the germinative period ceases. In normal plants, grown in the light, this re-formation takes place sooner. At no time was free hydrocyanic acid detected in the plant tissues. If it is liberated at all during germination, it must at once disappear, forming fresh combinations.—Pharm. Journ., Jan. 9, 1909, 32; from Compt. rend., *147* (1908), 1023.

Phaseolunatin—Identity with Linamarin.—In 1903 Dunstan and Henry isolated a cyanogenetic glucoside from *Phaseolis lunatus* beans from Mauritius, which they called phaseolunatin (see Proceedings, 1904, 954), believing it to be distinct from any hitherto isolated glucoside. Subsequently, in conjunction with Auld (Proc. Roy. Soc., 1906, p. 145), they established the identity of this glucoside with

Linamarin, which Jorissen in conjunction with Hairs had isolated in 1891 from the seedlings of *Linum usitatissimum* (see Proceedings, 1892, 653), but they retained the name phaseolunatin for the glucoside. Jorissen now protests against this nomenclature, and claims on the ground of his sixteen years' priority that the original name, linamarin, should be retained, and that of phaseolunatin abandoned.—Pharm, Journ., Dec. 5, 1908, 726; from Journ. de Pharm. et Chim., *28* (1908), 462.

Apocynin (Aceto-Vanillone)—Characters and Synthesis.—H. Finnemore finds that the principal constituent of the root of *Apocynum cannabinum* —present in the amount of 0.2 per cent.—is identical with the crystalline apocynin of commerce, and, with the product, isolated in 1904 in minute quantities by Wood for pharmacological purposes. It has the composition $C_9H_{10}O_3$, forms slender, colorless prisms, melting at 115° C., and has a faint vanillin odor. It is convertible into a crystalline potassium derivative and into acetyl, benzene and methyl derivatives, melting points 57°, 106° and 51° C. respectively; it yields an oxime and a well-defined hydrazone and semi-carbazone, melting at 126° and 166° C. respectively; its mole-

cule contains a single methoxyl group, and, as it has no aldehyde properties, it follows that apocynin is a hydroxymethoxyacetophenone. It is in fact identical with the acetovanillone obtained by Tiemann from isoeugenol, and by Goldschmiedt and Hemmelmayr from scoparin. The author has now succeeded in synthesizing apocynin from vanillin by means of the Grignard process. Benzoylvanillin is converted by magnesium methiodide, with subsequent hydrolysis, into benzoyl-apocynol, melting point 128° C., the phenolic benzoyl derivative of the secondary alcohol corresponding with the ketone apocynin. This benzoyl compound is oxidized by chromic acid mixture to benzoylapocynin, melting point 106° C., which gives on hydrolysis 4-hydroxy-3-methoxyacetophenone, $MeO.C_6H_3(OH).CO.CH_3$, melting at 115° C.; this is identical with natural apocynin, and with acetovanillone prepared from guaiacol. The yields throughout are good. Apocynol, melting point 101° C., obtained by hydrolyzing the above synthetic benzoyl derivative, may also be formed, although with poor yield, directly from apocynin by the action of sodium amalgam. This alcohol and the corresponding dihydroxycarbinol, $C_6H_3(OH)_2.CH(OH).CH_3$, that is formed from it by the action of suitable hydrolytic agents promise to be of interest pharmacologically by reason of their very close relation to adrenine.—Pharm. Journ., Feb. 20, 1909, 222; from Proc. Chem. Soc., *24*, 344.

Asparagin—A Constituent of Unripe Pears.—P. Haber, in the course of an examination of the constituents of unripe pears, obtained in an alcoholic extraction some crystals which he identified as being asparagin. Repeating his experiments with pears in different stages of development he determined that pears in the unripe condition contain considerable quantities of asparagin, but that this quantity is diminished during the process of ripening until, finally, the juice of the perfectly ripe fruit contains no asparagin at all, Thus, pears gathered in early June yielded 0.45 per cent. while pears taken from the same tree about the middle of July yielded only 0.10 per cent. of asparagin.—Schw. Wschr. f. Chim. u. Pharm., xlviii (1909),No. 26, 401–402.

Bakankosin—A Glucoside from the Fruits of Strychnos vacacoua, Baill. E. Bourquelot and H. Hérissey, having received a further supply of "Bakanko" fruits, sent out from Madagascar, the botanical source has been definitely traced to *Strychnos vacacoua*, Baill., identical with *S. gerrardi*, Br., and probably with *S. baroni*, Bak. The ripe seeds of these yielded only 1 per cent. of bakankosin, compared with 4 per cent. obtained previously from the unripe seeds. The pulp and the shells of the seeds contain no glucoside. The identity of the glucoside in the ripe seeds with that already isolated from the immature fruits was established and its formula found to be $C_{16}H_{23}O_6N+H_1O$ $[a]_D=-196.8°$ C., solubilities at 20° C.—in water 8.053 : 100; in alcohol 95 per cent., 1.794 : 100 : in methyl alcohol, 24.5 : 100;

in anhydrous acetic ether 0.032 : 100. Unlike other nitrogen-containing glucosides, bakankosin is not affected, at ordinary temperatures, by traces of barium hydroxide. Its products of hydrolysis have yet to be investigated. Provisionally, the equation of the hypothetical reaction may be given as follows: $C_{16}H_{23}O_8N + H_2O = C_6H_{12}O_6 + C_{10}H_{13}O_3N$.—Pharm. Journ., Dec. 5, 1908, 726; from Journ. de Pharm. et Chim., *28* (1908), 433.

Elaterin—Chemical Formula.—A. Berg has previously shown that elaterin does not exist as such in the fruit of *Ecballium elaterium*, but is formed at the time of their expression by the action of a peculiar diastase, elaterase, on an amorphous glucoside. He now gives the formula of elaterin as $C_{28}H_{38}O_7$.—Pharm. Journ., June 5, 1909, 770.

Erytaurin—A Glucoside from Erythræa Centaureum.—Hérissey and Bourdier have isolated a glucoside from centaury (*Erythræa centaureum*) which possesses distinct characters. It crystallizes in small colorless prisms, having a bitter taste, and forming neutral solutions which are not reducible by Fehling's Solution. Its specific rotation is $(a)_D = -131.6°$–$134.4°$; but its solution is hydrolysed by the action of emulsin, splitting off glucose (probably d-glycose), and then becomes strongly dextro-rotatory.—Pharm. Ztg., liii (1908), No. 81, 797; from Journ. d. Chim. et Pharm. xxviii (1908), No. 6.

Oleuropein—A New Glucoside from Olea Europæa.—Bourquelot and Vintilesco have isolated a new glucoside from the olive tree, which they have named "oleuropein." The glucoside exists in all parts of the plant, but variable in quantity in the different organs and also according to season, and was obtained by the so-called "emulsin method" of Bourquelot (see Proceedings, 1908, 406). Oleuropin constitutes a faint yellowish, somewhat hygroscopic powder, having a bitter taste; tolerably soluble in cold water and in hot alcohol, sparingly soluble in cold alcohol. It is optically lævogyre, $(a)_D = -127°$. The aqueous solution is colored yellow by alkalies, blood-red by concentrated sulphuric acid, and green by dilute solution of ferric chloride. The glucoside, which is completely precipitable by lead subacetate, is split up by emulsin, but the authors have so far only determined glucose as a product of the hydrolysis.—Pharm. Ztg., liii (1908), No. 91, 900; from Jour. de Chim. et de Pharm., xxviii (1908), No. 7.

Oxypeucedanin—A constituent (in the amount of 10 per cent.) in the rhizomes of *Imperatoria ostruthium* (Masterwort) which see under "Materia Medica."

Pimpinellin — Characters, Properties and Constitution.—Herzog and Hâncu report the results of a comprehensive inquiry into the characters, chemical properties and constitution of pimpinellin, a crystalline body present in the root of *Pimpinella saxifraga*, L., which has heretofore been

only imperfectly studied (by Buchheim in 1872, and by Heut, in 1898). The present authors find that pimpernel root contains besides sugar a much larger quantity of this crystalline body than has been assumed: 5 kgm. of root yielding by the method of extraction employed by them, from 25 to 30 Gm. of the crude product. When purified, pimpinellin constitutes long, shining, white needles, melting at 119° C., which are easily decomposed on exposure to light, becoming yellow, and have the composition and molecular weight corresponding to the formula $C_{13}H_{10}O_5$. It is obtained by extracting the root with benzene, evaporating the extraction to a small volume, adding petroleum ether to the residue, and recrystallizing the resultant crystalline mass several times from hot alcohol. The authors regard it as probable that pimpinellin is a lactone; it contains two methoxyl groups in the above mentioned molecule, and in accordance with this, its constitutional formula is expressed by: $C_{10}H_4O.CO.O(OCH_3)_2$.

By the oxidation of pimpinellin an acid, apparently tri-basic, and melting at 212°–220° C., is produced, which bears some resemblance to "phthalic acid." Taking into consideration the composition of the pimpinellin formula and the conversion of pimpinellin into an acid resembling phthalic acid in some of its relations, the authors are led to the inference that pimpinellin is a naphthalin derivative, which by oxidation is transformed into a substituted phthalic acid.—Arch. de Pharm., 246 (Sept. 16, 1908), No. 6, 402–414.

Rhein—Presumably not a Single Body.—While the formula $C_{15}H_{10}O_6$ is generally accepted for rheïn, O. A. Oesterle and Ed. Tisza, operating with an exceptionally pure product, recrystallized 20 times from pyridin and finally sublimed *in vacuo*—obtained results which led to the formula $C_{15}H_8O_6$. Rhein cannot therefore be regarded as "tetraoxyanthraquinone." By acetylation no higher acetyl product, such as diacetylrhein was obtainable; nor were satisfactory products obtained by treatment with propionic acid anhydride by benzoylation, or by methylation. The authors express the opinion that rhein is not a single body, and that it represents a mixture of several, but they contemplate to continue their investigations with larger quantities of rhein, now being prepared, in the hope of arriving at a more definite conclusion.—Schw. Wchschr. f. Chem. u. Pharm., xlvi (1908), No. 44, 701–703.

Rhein—Contention that it is a Single Body.—Referring to the observations and consequent conclusions of Oesterle and Tisza mentioned in the preceding abstract, Hesse contends that the formula $C_{15}H_{10}O_6$, which he had originally assigned to rhein, is correct, and publishes in juxtaposition the various analytical results which support his contention. Furthermore, he maintains that the rhein subjected to examination by him is not, as conjectured by Oesterle and Tisza, a mixture of several bodies, but is in fact a single body, to which his formula properly applies. On the other

hand, it is very probable that the rhein examined by the before-mentioned authors, as well as that of former investigators of the subject, contained a body in admixture having a greater carbon content than the single body, to which the name rhein is properly applied.—Pharm. Ztg., liii (1908), No. 99, 981; from Südd. Apoth.-Ztg., 1908, No. 96.

Saponin of Polyscias Nodosa, Forst.—*l-Arabinose one of the Products of Hydrolysis.*—A. W. van der Haar has made a comprehensive study of the hydrolytic products of the toxic saponin present in the leaves of *Polyscias nodosa*, Forst. He finds this saponin to have the composition $C_{25}H_{42}O_{10}$, and that by hydrolysis it splits up into *l*-arabinose, *d*-glucose and sapogenin. This saponin is therefore the first saponin of which it may be stated with certainty that it contains an arabinose complex.—Arch. d. Pharm., *247* (1909), No. 3, 213–220.

Saponin of Nephalium Lappaceum, a toxic glucoside, which see under "Materia Medica."

Albuminoids.

(*Including Animal Products*).

Protein Compounds with the Heavy Metals are discussed in a paper of H. A. B. Dunning, with special reference to solutions of iron albuminate and the peptonates in certain preparations of the National Formulary, in the "Proceedings" of this Association, 1908, 845–849.

Milk and Casein—Normal Digestion.—From experiments performed on dogs with permanent duodenal fistulas, L. Gaucher found that casein passes from the stomach into the duodenum at first in a liquid form and then in a caseous state. It is never peptonized in the stomach. This passage through the organ is more rapid when the stomach is empty and the digestion normal. Coagulation of milk is in no way essential to its digestion, and if milk coagulates in the stomach, it is neither to enable it to be retained nor to allow it to undergo peptic digestion. In certain cases this coagulation of milk in the stomach may be harmful to its digestion. In consequence of insufficient gastric movement, or of spasmodic closing of the pylorus, the coagulated casein forms an indigestible mass, which is ultimately either rejected by the stomach and regurgitated, or passes in small fragments at a time through the pylorus. These fragments, being difficult to disintegrate and dissolve, set up irritation of the intestinal mucous membrane. These effects are shown by the vomiting and diarrhœa, which indicate intolerance of a milk diet.—Pharm. Journ., Jan. 30, 1909, 120; from Compt. rend., *148* (1909), 53.

Milk—Action of Hydrogen Dioxide on the Enzymes.—In a sample of milk suspected of having been preserved with hydrogen dioxide, tests were made by Charles H. La Wall for that substance by three different

methods, two of them being reversals or adaptations of the methods commonly employed for the detection of boiled or sterilized milk, or milk in which the enzymes had been destroyed by heating, and both depending on the development of a strong blue coloration on the addition of H_2O_2 to the milk containing a few drops of the reagent—paradiamidobenzene in the one case (Dupouy's method) and benzidine or paradiaminodiphenyl (Wilkinson and Peters test) in the other. The results of experiments by La Wall indicate: (1) that hydrogen dioxide, when added in small amounts to milk, can only be detected within a few hours after such addition, and that the resulting milk remains sweet several days at ordinary temperature; (2) that it inhibits and destroys the action of the enzyme reacting with the Wilkinson-Peters test much more rapidly than it affects the enzyme reacting with the Dupouy test; and (3) that eventually it destroys the action of both of these enzymes and causes the milk to react the same as boiled or sterilized milk.—Amer. Journ. Pharm., Feb., 1909, 57–59.

Cow's Milk—Character of Enzymes Present.—Joseph W. England has made a critical study of the nature of the enzymes existing in cow's milk. He says that milk is not simply a mixture of chemical compounds. It is an organized tissue, as much so as blood. In fact the resemblance is so close that it could be called "white blood." It contains not only fat, proteids, sugar, salts and water, but also the elements that go to make up blood. Among these may be mentioned the enzymes or ferments, the presence of which has been known for a decade or more, but their physiological significance, in the growth and development of the tissues of the body, has been apparently entirely overlooked. Quoting the findings of different investigators, the author considers it to be demonstrated that cow's milk contains numerous ferments, and these have been found also in the milk of a number of mammifers, such as the ass, mare, goat, sheep, sow, buffalo and woman. The ferments found in cow's milk are curdling, proteolytic or proteid-digesting, amylolytic or carbohydrate-digesting, and hydrolytic or fat-splitting. The quantities of the ferments present are small, but when we consider that they are catalyzers and exert their power over and over again after the end products have been removed from them, that they are probably the source from which the growing body gets its natural supply of ferments, and that they accumulate within the body, the physiological significance of their presence in milk becomes apparent.—Amer. Journ. Pharm., April, 1909, 177–181.

Milk—Lecithin Content of Different Kinds.—Nerking and Haensel have determined the percentage of lecithin in the different kinds of milk as exhibited in the following table:

Percentage in :	*Maximum.*	*Minimum.*	*Average.*
Human milk.....	0.0799	0.0240	0.0469
Cow's milk	0.1163	0.0364	0.0627
Ass's milk	0.0393	0.0058	0.0166
Sheep's milk.....	0.1672	0.0509	0.0833
Goat's milk	0.0753	0.0364	0.0488
Mare's milk	0.0174	0.0073	0.0109

—Pharm. Ztg., liii (1908), No. 91, 900 ; from Bioch. Ztschr., xiii (1908), 348.

Milk—Sensitive and Rapid Method for the Detection and Estimation of Formaldehyde.—H. S. Shrewsbury and A. W. Kapp consider the following to be the most delicate test for the detection and estimation of formaldehyde in milk. The reagent is made by mixing 0.1 Cc. of pure nitric acid (or 1.6 Cc. of normal nitric acid) with 100 Cc. of concentrated hydrochloric acid. To 5 Cc. of milk in a test tube (about 18 Cm. by 2 Cm.), 10 Cc. of the *freshly made* reagent is added, the mixture is shaken vigorously and kept for ten minutes in a water-bath at a constant temperature of 50° C. The tube and its contents are then cooled rapidly to about 15° C. A violet color shows the presence of formaldehyde, and its intensity indicates the amount, which may be estimated by means of standards put on at the same time. If the color obtained is deeper than that shown by six parts of formaldehyde per million of milk a dilution should be made with pure milk. By this method delicate quantitative reactions are obtained with milk containing 0.2 to 6.0 parts of formaldehyde per million.—Pharm. Journ., March 20, 1909, 394 ; from Analyst., Jan., 1909, 12.

Milk—Detection of Sodium Bicarbonate.—F. Lelli detects the presence of sodium bicarbonate in milk as follows: To 10 Cc. of the milk add an equal volume of water and 0.10 Cm. of acetyl-salicylic acid ; heat on the water-bath at 60° C. for ten to twenty minutes. If the milk be normal the casein will collect on the surface of the liquid in the tube while the subjacent liquid will be limpid. In presence of sodium bicarbonate the liquid will be opaque or lactescent. On adding 8 to 10 drops of a 10 per cent. solution of ferric chloride to the filtered liquid, pure milk will remain unaffected, while that containing sodium bicarbonate will give an abundant reddish yellow precipitate.—Pharm. Journ., Sept. 5, 1908, 280 ; from Arch. di farm., Sper., through Bull. Soc. Royal de Pharm. de Brux., *8* (1908), 241.

Milk—Absorption and Elimination of Medicaments.—Having in previous researches already determined experimentally that a large number of medicaments are in general not eliminated from the organism through the milk, L. van Itallie has now extended his investigation to the elimination of arsenic trioxide, fluorescin, phenolphthalein and rhubarb, with practically the same results. Arsenic was, however, detected in the milk in

traces after long-continued use of Fowler's Solution, and the author concludes from this observation that the prolonged use of a medicament has some influence on their absorption by the milk. Furthermore, he considers it possible that the ability of the elimination of medicaments through the milk may vary in different kinds of animals.—Arch. d. Pharm., *246* No. 8 (Nov. 14, 1908), 593–595.

Milk—Absorption of Iodides in the Organism.—In connection with the preceding paper, Mrs. A. Reijst-Scheffer communicates the results of an investigation on the absorption of iodide by milk, which has heretofore been observed by Stumpf, Schneidemühl, van Itallie and others, the present investigation being directed particularly to determine in what portion of the milk the largest amount of iodine is absorbed. The results have demonstrated that the fat contains no iodine whatever, that the casein contains minute quantities only, and that it is substantially in the liquid portion of the milk freed from casein and fat. Furthermore, the author found that the amount of iodine eliminated by the urine of cows which had been dosed with sodium iodide is far greater than that found in the milk of the same animal.—Ibid., 595–598.

Citrated Milk—Advantage as Infant Food.—F. Langmead again directs attention to the value of sodium citrate as an addition to cow's milk for feeding infants. He says that in 1893, Sir Almroth Wright pointed out that the formation of a hard curd in undiluted cow's milk can be obviated by the addition of 2 grains of sodium citrate to each ounce and that milk so treated gives a soft, flocculent curd, like that of human milk, when brought into contact with the gastric secretion. In 1904 Dr. Poynton again directed attention to the method, which does not appear to have been generally taken up. Langmead now states that he reared about seventy cases on undiluted citrated cow's milk, with most satisfactory results. The milk is prepared by adding a solution of 8 grains of sodium citrate in 1 drachm of water to each 4 ounces of fresh cow's milk, just brought to the boil.—Pharm. Journ., May 15, 1909, 645; from Med. Press, *87* (1909), 241.

Kefir—Russian Method of Preparation.—The "Pharmaceutische Journal für Russland" describes the following method for preparing kefir: 2.5 Gm. of kefir-fungi (or grains) are macerated one day in water at 16°–19° C., then well washed, added to 2 liters of skim-milk, and allowed to stand another day. The fungi are then decanted from the milk, washed twice with water containing a little soda, and again added to skim-milk—this manipulation and treatment being repeated daily for 4 or 5 days. So prepared, the kefir-fungi are now added to from 8 to 10 liters of unskimmed milk, allowed to stand one day at the temperature of the room. The kefir grains having been strained off, through a sieve, the resulting kefir is now ripened completely by transferring it to bottles which are three-

fourth's filled and allowed to stand one day more at room temperature. It is then ready for use. The kefir grains, after washing on the sieve are immediately added to a fresh portion (8–10 liters) of milk, and a daily and continuous supply of kefir is thus insured from the original portion of fungi used.—Pharm. Ztg., liii (1908), No. 65, 638.

Blood—Sensitive Reagent.—Meyer recommends a new and highly sensitive reagent for the detection of blood, which is made as follows: Phenolphthalein, 2; potassium hydroxide, 20; powdered zinc, 10; distilled water, 100. The mixture is boiled until decolorized, when it is filtered, and kept in the dark protected from the air. Two or three Cc. of the liquid to be tested is poured on to 1 Cc. of this reagent in a tube, and two or three drops of 12-volume hydrogen peroxide added. The presence of the smallest trace of blood suffices to bring about the immediate coloration of the whole of the liquid—red-fuchsin—more or less intense. The reagent is said to be more sensitive than the spectroscope, and it detects the presence of blood in a solution so dilute as 1 in a million. The reaction does not depend upon the hæmoglobin or the oxidizing ferments, seeing that putrified or dried blood behaves in the same way.—Pharm. Journ., Jan. 2, 1909, 6; from Rép. de Pharm., Oct. 10, 1908, 442.

Blood—Detection in Urine and Fæces.—Delsart recommends the following method for detecting blood in urine and fæces: Crystalline guaiacol, 0.05 Gm., is dissolved in about 1 Cc. of alcohol; to this 2 Cc. of hydrogen peroxide, 10 volumes, is added; then 4 to 6 Cc. of the urine. On shaking the mixture a bright reddish-brown color, resembling that of the martagon lily, indicates the presence of blood. The color is completely soluble in chloroform, and on shaking out with that solvent the aqueous solution is decolorized, the chloroform becoming tinted. Fæces should be treated with a little water, filtered, and the filtrate made faintly acid before applying the above test.—Pharm. Journ., March 27, 1909, 424; from L'Union Pharm., *49* (1908), 569.

Digestive Enzymes—Presence in Invertebrates.—In a paper read before the British Association, 1908, Dr. Herbert E. Roaf records the results of experiments made to ascertain the presence of the various hydrolytic enzymes in a number of invertebrates. The enzymes were prepared by treating the fresh-minced tissue with an equal weight of glycerin, and after keeping some time the extracts were strained through cotton. Certain of these extracts were precipitated by alcohol, and the coagulum extracted by water. The method of preparation appeared to affect the nature of the proteoclastic enzyme found. The animals and organs examined were the following: *Cancer pagurus*, the digestive gland; *Patella vulgata*, the visceral hump; *Echinus esculentus*, the intestine; *Ophiocoma nigra*, the disc; *Asterias rubens*, the pyloric calla and stomach; *Tealia crassicornis*, the mesenteric filaments; *Alcyonium digitatum; Cliona celata;* and *Cel-*

laria fistulosa. The methods of examination and tabulated results must be consulted in the original communication, in Pharm. Journ., Sept. 12, 1908, 298.

Pepsin—Estimation by Means of the Edestin Test.—It is shown by the experiments of E. Fuld and L. A. Levisen, that by using pure crystallized "edestin" it is possible to obtain a clear solution whose protein content is directly dependent on the amount of substance dissolved; such a solution is very suitable for digestion experiments. A solution of edestin (1.1000) in $\frac{3}{100}$ N. hydrochloric acid is at once converted into edestan, whereas edestin albuminoses remain dissolved under the same conditions, a circumstance which enables one to follow the progress of a digestion and to ascertain the strength of pepsin solutions or gastric juices in a very short time at the ordinary temperature. For this purpose a series of increasingly dilute samples of the liquid to be examined are allowed to act on equal quantities of an edestin solution until the minimum quantity of the liquid has been found, which suffices in half an hour to prevent the precipitation of 2 Cc. of edestin solution by solid sodium chloride.—Pharm. Journ., June 12, 1909, 795; from Biochem. Ztschr., *6*, 473–501, through Ztg. f. Unters. d. Nahr.-u. Genussm., *17* (1909), 203.

Gastric Juice—Detection of Free Hydrochloric Acid by Günzburg's Reagent.—F. A. Steensma has modified Günzburg's reaction in such a way as to render it more delicate. The reagent he uses is composed of phloridzin, 2 Gm.; vanillin, 1 Gm.: dissolved in absolute alcohol, 30 Cc. A drop of this reagent is placed in a small porcelain capsule, and the capsule placed on a boiling water-bath; when the alcohol has evaporated, there remains a feeble yellow-colored ring on the capsule. One or two drops of the liquid to be tested are placed, by means of a glass rod, in the center of this ring, in such a way that the liquid is in contact with the internal edge of the ring. If the liquid contains free hydrochloric acid, there is formed on the internal edge of the ring a bright red band which is reduced to a simple line when hydrochloric acid is present in very minute quantity. The use of a water-bath is essential for the success of the reaction. This reagent, like that of Günzburg, does not keep for any length of time. On replacing ethyl alcohol by methyl alcohol, the reaction is more delicate, but the solution of phloridzin and vanillin in methyl alcohol alters very rapidly, so that it is necessary to prepare the reagent extemporaneously for each test.—Pharm. Journ., Jan. 16, 1909, 60; from Biochem. Ztschr., 1908, 210.

Zymase of Carica Papaya—An Efficient Milk-Curdling Ferment.—C. Gerber finds that the zymase of the papaw resists the action of high temperatures in a very marked degree, much more than the milk-curdling ferment of the Chinese mulberry, or that of the gastric juice. At the same time it coagulates the milk at a low temperature, even at 0° C.,

without the aid of added calcium chloride. Milk varies in its coagulability with this ferment, according to its degree of freshness. At the moment of milking it is much more readily coagulated, and becomes more resistant the longer the interval between milking and adding the juice.—Pharm. Journ., June 26, 1909, 862; from Compt. rend., *148* (1909), 497.

Pancreatin Testing.—The interference of sodium bicarbonate in the testing of pancreatin is discussed in a paper presented by Chas. E. Vanderkleed and L. Henry Bernegau, which is printed in the "Proceedings" of this Association, 1908, 941–943.

Amylase—The Amylolytic Ferment of Egg-Yolk.—H. Roger has studied the nature and characters of the ferment of egg-yolk which converts starch into sugar. This ferment is remarkable for the slowness and the length of duration of its action. After one hour's contact with starch the saccharification has commenced, and it takes a month or more to complete it. A remarkable feature about the ferment is that it is soluble in ether. It may be isolated by extracting the egg-yolk with ether and evaporating the liquid thus obtained at 38° C. The residue acts as a saccharifying ferment, the action being induced by thoroughly mixing it with starch paste, so as to form an emulsion. The action of the ethereal extract, like that of ordinary ferments, is destroyed by heat, and at 100° C., or even at 80° C., it is quite inactive. After extracting the yolk with ether a whitish, viscous mass remains, which, on treatment with distilled water, is still capable of saccharifying starch. From the results obtained it would appear that yolk of egg contains three amylolytic ferments; one soluble in ether, one soluble in water, and another insoluble in these two liquids. In reality, however, the author believes that there is only one ferment, which is intimately united to the different substances constituting the yolk, one part of the ferment being united to the fatty substances, forming a zymolipoid which ether dissolves, another portion, and the most important one, clinging to the albumins and other substances removable by water, while the third portion is fixed to the substances which form the insoluble residue.—Pharm. Journ., Oct. 3, 1908, 434; from Bull. Commerc., August, 1908, 377.

Salikase and Arbutase—New Enzymes.—Sigmund describes two new enzymes, the one, "salikase," contained in different species of *Salix* and *Populus*, the other, for which he proposes the name "arbutase," contained in various Ericaceæ (*Calluna vulgaris* and *Vaccinium myrtillus*), splitting up their glucosidal constituent, arbutin. The hydrolysis of salicin by the action of the associated salikase was indubitably demonstrated, the cooperation of bacteria and confusion with emulsin being excluded. The same is true of the hydrolytic action of "arbutase" on arbutin, which resulted in the splitting off of its characteristic hydrolytic product hydro-

quinone.—Pharm. Ztg., liv (1909), No. 19, 187; from Monatsh. f. Chem., 1909, No. 1.

Lactic Ferments—Action in Gastro-Intestinal Affections.—Boussard and Gautrelet find that acid forming ferments neutralize alkaline decompositions and hinder the free growth of proteolytic bacilli. This explains the therapeutic use of lactic bacteria in intestinal diseases. Under their influence the stools lose their fœtor, the tongue becomes normal, the liver is relieved of congestion, and the symptoms of auto-intoxication disappear. Bacteriological examinations show that the normal flora of the bowels have reappeared. Analysis of the urine shows a decrease in the relation of the sulpho-compounds and the sulphates.—Pharm. Journ., April 17, 1909, 528; from Rev. de Therap. Med.-Chir., through The Practitioner, March, 1909, 429.

Gelatin—Action of Formaldehyde.—A. and L. Lumière and A. Seyewetz have sought to establish whether gelatin, which has been rendered insoluble by the action of formaldehyde, is a definite chemical compound or simply gelatin containing indefinite quantities of the formaldehyde; whether formaldehyde-gelatin is to be regarded as an aldehydic body or simply an addition product. On immersion in formaldehyde solution gelatin takes up, according to circumstances, various quantities of formaldehyde, the maximum being 4.0 to 4.8 per cent. of its dry weight. The more concentrated the solution of formaldehyde (up to 10 per cent.) the more quickly is it absorbed, and temperature does not appear to exert any marked influence on the action. Formaldehyde vapor acts much more slowly on gelatin than does the solution, but the quantity finally absorbed is the same in both cases. Formaldehyde-gelatin is gradually decomposed by hot water, and by repeated treatment with it, is completely dissolved. On heating to a temperature of 110° C. the formaldehyde is split off; 15 per cent. hydrochloric acid decomposes it in the cold into its constituents without altering either. Formaldehyde-gelatin would thus appear to be an addition product rather than a definite compound.—Pharm. Journ., Sept. 26, 1908, 402; from Rev. gén. de Chim. pure et appliqué, 1908, 295.

Agrosterol—A Cholesterol Substance Present in Soil.—According to O. Schreiner and E. C. Storey, a cholesterol substance to which the name "agrosterol" has been given, has been isolated from the Marshall clay of North Dakota, a black soil containing 10.6 per cent. of organic matter and 0.51 per cent. of nitrogen. It is obtained by extracting the soil with boiling 95 per cent. alcohol, concentrating to a small volume, filtering, evaporating, treating the residue with cold ether, evaporating the ether, and treating the thick viscous residue with successive small quantities of cold absolute alcohol to remove coloring matter. The residue, which is nearly white, is readily soluble in ether and crystallizes from that solution

in radiating clusters of needles. When this is dissolved in hot 80 per cent. alcohol, it crystallizes in flat plates very similar in appearance to those of phytosterol. It melts at 237° C. (uncorr.), is readily soluble in ether or chloroform, little soluble in cold alcohol, readily so in hot alcohol, and almost insoluble in hot water. It is unaffected by treatment with alcoholic potash, and when crystallized from 80 per cent. alcohol, it contains water of crystallization, which it loses at 100° C. It responds readily to Liebermann's cholesterol reaction, but gives no other color tests for members of this group. The color produced is intense, appears immediately, and shows well with a very minute quantity. The composition agrees closely with the formula, $C_{26}H_{44}O$. The melting points of most of the known cholesterol substances are much lower than that of the body obtained from the soil. Liebermann's test, which is characterized by the violet coloration, is best performed by dissolving a very small quantity of the substance in a few drops of chloroform, adding about 1 Cc. of acetic anhydride, and then one drop of concentrated sulphuric acid.—Pharm. Journ., Febr. 13, 1909, 188; from Journ. Amer. Chem. Soc., *31*, No. 1.

Ergosterin—Association with "Fungisterin."—Tanret finds that ergosterin, the cholesterin-like body obtained by him a number of years ago from ergot (see Proceedings, 1889, 633), is not a single body as then supposed, but is associated to the amount of about 12 per cent. of its weight with a substance which he has named "fungisterin." The two bodies, in their pure condition, are now described by the author as follows:

Ergosterin, $C_{27}H_{40}O.H_2O$, forms non-efflorescent, mono-clinic leaflets or needles, which loose their water of crystallization completely when heated to 105° C., but rapidly absorb the water again on exposure to air. It is soluble in hot alcohol, lævogyre, and melts at 165° C.

Fungisterin, $C_{25}H_{40}O.H_2O$, forms similar crystals, which do not retain their water of crystallization, however, as firmly as does ergosterin, and melt at 144° C.

The two bodies are furthermore differentiated by the following reaction: If some *fungisterin* is brought in contact with a few drops of 90 per cent. sulphuric acid, the acid assumes a ruby-red color in a few seconds, changing to violet red in a short time; while *ergosterin*, under the same conditions and proportions, simply produces a dirty-red color. Both substances are slowly oxidized and acquire color when exposed to air.—Pharm. Ztg., liii (1908), from Comp. rend., *147*, 75.

Spongosterol—A New Cholesterol from Sponge.—M. Henze has isolated a new cholesterol from sponge, which he has named "spongosterol." It has the formula, $C_{27}H_{46}O$, or $C_{27}H_{44}O$, melts at 123°–125° C., and differs from cholesterol by not forming bromo-additive compounds, but gives substitution compounds. The acetate melts at 242.5° C., and the bromo-acetate at 157° C. The latter regenerates the acetate when reduced, and

this, on saponification, yields spongosterol.—Pharm. Journ., Oct. 10, 1908, 464; from Ztschr. Physiology Chem., *55* (1908), 457, through Journ. de Pharm. et Chim., *28* (1908), 277.

Adrenine—Reactions.—G. Comessatti finds that if 3 or 4 drops of 1 : 1000 solution of adrenine be diluted with 5 or 6 Cc. of water and a few drops of or 2 : 1000 mercuric chloride solution be added, after agitation, a diffused reddish color appears in two or three minutes. If adrenine solution alone be thus diluted and shaken, it slowly acquires a similar color, but not for a much longer time, remaining colorless for from half an hour to two hours, and then showing a similar but not so pronounced red color, probably due to the formation of oxy-adrenine. Aqueous pyrocatechol solution 1 : 1000. gives, when added in a similar manner to adrenine solution alone, a barely evident permanent greenish shade. On adding a drop or two of 1 : 1000 sublimate solution to a similar mixture, a reddish color appears in one to three minutes, which does not fade. Solutions of salicylic acid and of resorcinol also give color reactions with sublimate, but quite distinct from, the above.—Apoth. Ztg., xxiii (1908), No. 78, 715; from Münch. Med. Wschr., 1908, 1906.

Adrenine—Antagonism to Pancreatic Extract.—G. Zuelzer describes some interesting experiments concerning the antagonism between adrenine and the internal secretion of the pancreas. The author has discovered that the glycosuria which follows injection of adrenine may be certainly prevented by the injection also of pancreatic extract. It makes no difference whether the two are injected simultaneously or the pancreatic extract first, the glycosuria always fails to appear. He believes that pancreatic diabetes, both in dogs in which the pancreas has been extirpated, and in man, is a negative pancreas diabetes and a positive adrenine diabetes; that is to say, it is due to the presence of adrenine which is not neutralized by the pancreatic hormone. This neutralization probably takes place in the liver. By taking the pancreas from living animals at the height of digestion and after congestion of the organ, a very strong extract was obtained, which, on intravenous injection into dogs with pancreas diabetes, diminished the excretion of sugar to a very marked degree. This extract was tried in a number of cases of diabetes, most of them with acidosis, with considerable success. Acetone and diacetic acid disappeared from the urine, and the glycosuria in several cases entirely disappeared.—Pharm. Journ., Oct. 24, 1908, 516; from D. Med. Wschr. *32*, Aug. 6, 1908.

Synthetic Suprarenin—Reactions.—Dr. Ludwig Krauss, operating with two specimens of synthetic suprarenin of reliable manufacture, has determined the following reactions:

Conc. sulphuric acid dissolves suprarenin with a yellowish color, which on addition of a drop of 25 per cent. nitric acid changes to yellow-red.

If bismuth subnitrate is sprinkled on the yellow sulphuric acid solution, a brown color is at first produced, followed by yellow-red.

Formalin-sulphuric acid dissolves suprarenin with a rose-red color, changing later to cherry-red.

Fröhde's reagent produces a brown solution, becoming greenish after some time.

Fuming nitric acid dissolves suprarenin with a blood-red color, rapidly changing to yellow. On careful evaporation on the water-bath a yellow residue results, which when touched with a little ammonia becomes handsome blue-green, and after some time assumes a dirty green color.

Millon's reagent dissolves the suprarenin with a yellow red color.

With chlorine water a yellow solution is produced, becoming handsome red on supersaturation with ammonia.

Potassium ferricyanide solution is colored yellow red by suprarenin.

If a fragment of potassium ferricyanide is dissolved in little water, and a drop of ferric chloride solution is added, a brown solution is produced which is changed to a fine blue green on addition of suprarenin—this reaction being producible with a 1 : 1000 dilution.

If a very small quantity of iodic acid is dissolved in a little water, some chloroform added and then a trace of suprarenin (or a few drops of 1 : 1000 solution), iodine is immediately liberated, and the chloroform assumes a rose color. If then the mixture is allowed to stand some time, the rose color of the chloroform gradually disappears, and the supernatant watery fluid assumes a permanent, fine rose-red color.—Apoth. Ztg., xxiii (1908), No. 77, 701.

Synthetic Suprarenin—Separation into Two Distinct Optically Active Isomeric Components.—When a naturally occurring optically active substance is prepared synthetically in the laboratory the product is almost always the racemic form, and following this rule, while the natural suprarenin is levorotatory "synthetic suprarenin" (o-dioxy-phenyl ethanol-methylamine), although chemically identical, is optically inactive. While in this and other respects, the two substances show certain differences in chemical and physical properties, some authorities quoted came to the conclusion that in their physiological properties they were very similar. A. R. Cushny, however, who made experiments on dogs, came to the conclusion that the synthetic suprarenin was weaker than the natural in its power of raising the blood pressure, attributing this to the presence of a dextrorotatory, physiologically inert isomer, which he believed to compose one-half the substance. Following up this suggestion, Franz Flächer has attempted and eventually succeeded in separating synthetic suprarenin into two optically active isomeric components, the one levorotatory, the other dextrorotatory, by the following simple method: Synthetic suprarenin was moistened with methyl alcohol and dissolved in a hot methyl alcohol solution of the molecular equivalent of dextro-tartaric acid; the alcohol was distilled off *in vacuo* at about 35° to 40° C., and the residue made to crystallize by seeding with a trace of the acid dextro-tartrate of

levo-suprarenin. The crystals were well dried *in vacuo* and then stirred with methyl alcohol, when the acid dextro-tartrate of levo-suprarenin remained undissolved, while the isomeric salt dissolved. The crystals were filtered out, washed with methyl alcohol, and recrystallized from 90 per cent. ethyl or 95 per cent. methyl alcohol, until a product was obtained with melting point 149° C., two or three recrystallizations being necessary. The base recovered from this showed rotation $[a]_D^{19.6°} = -51.4°$. Natural suprarenin, which had been purified by forming the bitartrate, showed rotation $[a]_D^{19.8} = -51.4°$. The synthetic levo-suprarenin obtained by the method just described was identical in every respect with the natural substance. Both melt at 211° to 212° C. (uncorr.), and form oxalates and hydrochlorides which do not crystallize.

From the methyl alcohol mother-liquor the base was recovered and submitted to a similar treatment with levo-tartaric acid. In this way the dextro base was obtained pure, and this showed rotation $[a]_D^{19.8°} = +51.88°$; this base also melts at 211°–212° C. (uncorr.), and forms an oxalate and a hydrochloride which do not crystallize.—Pharm. Journ., Jan. 9, 1909, 27.

Synthetic Suprarenin—Action.—Having received some pure *l*- and *d*-suprarenin prepared from "synthetic suprarenin" by Dr. Flächer (see preceding abstract), Arthur R. Cushny investigated these in the same way as before, and found the synthetic *l*-suprarenin equal in power to the natural suprarenin, while the synthetic *d*-suprarenin was very much weaker. The experiments performed indicate the relative power of *l*- and *d*-suprarenin to raise the blood pressure to a definite point to be about 12 : 1. This agrees very satisfactorily with his results of last year, in which the racemic body was compared with the lævorotary.—Pharm. Journ., Jan. 16, 1909, 56.

FIG. 62.

Sediment Collector.

Urine — Simple Apparatus for Collecting Sediment.—Szamatolski has constructed and recommends the simple apparatus for collecting sediments in urine for microscopical examination shown by Fig. 62, which is used as follows: The little apparatus, open at the point and closed at the top by means of a clip, is introduced into the urine contained in a wide-mouthed vessel. By pressing on the clip, urine is then admitted through the small opening at the point, and when filled to the level of the surrounding urine, it is allowed to stand undisturbed several hours, during which the sediment accumulates at the point of the instrument. A portion of the accumulated sediment may then be easily dropped on an object-glass and examined under the microscope in the usual manner.—Pharm. Ztg., liv (1909), No. 12, 117.

Referring to the above, O. Wentski observes that a radical defect of the method contemplated by the use of the apparatus of Szamatolski depends upon the fact that only the heavier portions of sediment will become available for microscopic examination. The deposition of sediment is no more rapid than with the ordinary form of sediment-tubes, and not nearly as complete as when the more expeditious method of centrifugation is employed.—Ibid., liv (1909), No. 14, 137.

Urine—Detection of Indican.—Solkowski recommends the following simple method for the detection of indican in urine: 1–3 Cc. of the urine is treated with 10 Cc. of 10 per cent. solution of copper sulphate, 1 Cc. of hydrochloric acid (sp. gr. 1.190), and a few Cc. of chloroform is added, and the whole is moderately shaken. In the presence of indican the chloroform is colored blue —Apoth. Ztg., xxiii (1908), No. 863; from Ztschr., physiol. Chem., *57* (1908), 520.

Urine—Determination of Acetone if Present.—G. Denigés recommends the following method for the determination of acetone in urine, which depends on the quantitative conversion of the acetone into iodoform in presence of an alkali and the subsequent liberation of the iodine: 100 Cc. of the suspected urine is placed in a capacious distilling flask with 0.5 Cc. of strong sulphuric acid and briskly distilled. The first 25 Cc. of distillate, exactly measured, is treated with 20 Cc. of $\frac{N}{10}$ iodine solution and 1 Cc. of caustic soda solution, specific gravity 1.332; the mixture is agitated; after five minutes' contact 1 Cc. of sulphuric acid and a little starch indicator is added. The free iodine is then determined in the usual manner with $\frac{N}{10}$ thiosulphate solution. Where a = the number of Cc. of thiosulphate used $(10 - a) \times 0.011$ gives the proportion of acetone in 1 liter of urine. For normal urine this figure is 2 to 3 Mgm. If the amount of acetone found exceeds 9 Mgm., the urine should be suitably diluted, and a fresh determination made. The method depends on the quantitative conversion of acetone into iodoform in presence of an alkali, and the subsequent liberation of iodine.—Pharm. Journ., Feb. 27, 1909, 272; from Bull. Soc. de Pharm. de Bord., through Rev. Pharm. *24* (1908), 357.

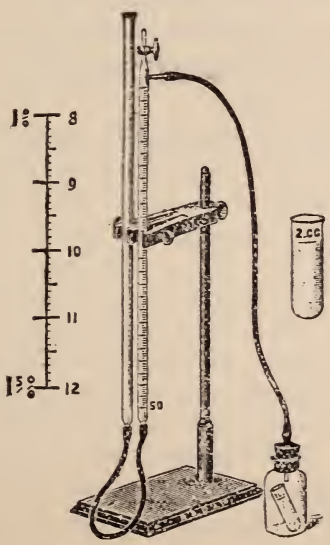
Urine—Microchemical Detection of Urotropine.—G. Denigés and Labat recommend for the microchemical detection of urotropine in urine a reagent prepared with iodine 6, potassium iodide 8, distilled water to make 150. A drop of this is placed on a micro-slide, and a drop, of the same size, of the urine is added to it and allowed to diffuse. The mixture is then examined with a low power, without a cover-glass. In the presence of urotropine, foliaceous crystals will be seen. These crystals are figured. On adding to 5 or 10 Cc. of the urine 0.5 to 1 Cc. of Tanret's reagent, allowing the mixture to stand for a few minutes, a precipitate will be formed in the presence of urotopine, which will be seen, on microscopical examination, to consist of more or less aggregated hexagonal crystals.

This reaction is less sensitive than the iodine test proposed by the author. —Pharm. Journ., April 10, 1909, 494; from Répertoire, *21* (1909), 61.

Urea—Occurrence in Fungi.—A. Goris and M. Mascré have confirmed the occurrence of urea in certain species of fungi. It was isolated two years ago from *Tricholoma georgii*, but the possibility of contamination by the urine of passing animals necessitated further investigation from material in which this could not possibly have occurred. The amount is considerable. From dried young *Psalliota campestris* the authors obtained 2.75 per cent., while the mature fungi yielded 4.3 per cent. The dried material was extracted with acetone, the solvent distilled off, and the residue taken up with water. The filtrate from this was treated with oxalic acid, which precipitated urea oxalate. From this salt the base was liberated with barium hydroxide, and when purified had the melting point 132° C., and all the characteristic reactions of urea. No urea was found in *Tricholoma pessundatum*, *T. album*, *Lepiota procera*, *Lactarius piperatus*, *Collybia maculata*, *Coprinus comatus*, or in *Psalliota xanthoderma*. Bamberger and Landsiehl, in 1903, found urea in *Lycoperdon bovista* and in *Lycoperdon gemmatum*.—Pharm. Journ., March 27, 1909, 424; from Compt. rend., *147* (1908), 1488.

Urea—A Handy Modification of the Nitrometer.—The apparatus shown

Fig. 63.



Dimmock-Brandon Urea Nitrometer.

by Fig. 63, which is supplied in England under the name of "Dimmock-Brandon Urea-Nitrometer," is designed for chemists and practitioners who are required to determine the amount of urea in urine with accuracy and dis-

patch. The measuring tube is graduated in percentages of urea as also in cubic centimeters, and the back is enameled to facilitate the scale-reading—the graduation being correct for the temperature 62° F. It is a handy, compact apparatus; easily manipulated, and possesses the further advantage of doing away with the two-way tap, and consequent elimination of the danger of leakage and frequent errors owing to turning in the wrong direction.—Chem. & Drugg., Nov. 28, 1908, 823.

Uric Acid—Characteristic Reaction.—Ganassini finds that if a solution of a zinc salt be added to an aqueous solution of uric acid, or to an alkaline urate there is formed a gelatinous precipitate of basic urate of zinc. This precipitate collected on a filter-paper passes from white to blue-green in consequence of atmospheric oxidation. The reaction is not interfered with by other bodies, such as albuminoids, and it serves for the detection of uric acid in urine, blood or the tissues. The test is recommended as both delicate and convenient.—Pharm. Journ., March 20, 1909, 394; from Gazzet. di. Osped., 1908, 679.

Hippuric Acid—New Characteristic Reaction.—According to Dehn hippuric acid may be directly detected in urine by the following reaction, which is extremely sensitive: A few cubic centimeters of urine are treated with sodium hypobromite until a permanent yellow color indicates the complete decomposition of the urea present. If the mixture is then heated to boiling, an orange to brown-red precipitate forms if hippuric acid is present or acquires a faint red color if the acid is present only in traces. The reaction is not produced by the other constituents of the urine.—Amer. Chem. Soc., xxx (1908), 1507.

Biliary Acids—A Study of Pettenkoffer's Reaction.—G. Guérin observes that the biliary salts (alkaline glycocholates and taurocholates) in aqueous solution give with a particle of saccharose and a large extent of concentrated sulphuric acid, at a temperature of about 70° C., a violet or purple coloration which disappears on the addition of water. This reaction, known as Pettenkoffer's reaction, is due to the formation of a trace of furfurol, produced by the action of the sulphuric acid on the sugar. Furfurol in very dilute solution gives a red-purple coloration with the biliary acids, in presence of strong sulphuric, at a temperature above 60° C. If the reaction be made with a considerable quantity of furfurol, instead of a trace, the coloration is blue. This coloration, whose intensity is proportional to the quantity of biliary acids present, is due exclusively to cholic acid. $C_{21}H_{32}(OH)(CO_2H)(CH_2OH)_2$, produced by the decomposition of glycocholic and taurocholic acids. If to a small quantity of cholic acid (or biliary salts), dissolved in 1 or 2 Cc. of alcohol, five or six drops of saturated aqueous solution of furfurol be added, and the whole mixed gradually with an equal volume of concentrated sulphuric acid, a blue coloration is immediately formed. If an aqueous solution be used, it is necessary to

double the number of drops of furfurol in order to obtain the blue coloration.—Pharm. Journ., Sept. 5, 1908, 280; from Journ. de Pharm. et Chim., July 16, 1908, 54.

Pure Cholic Acid—Preparation.—According to "Apoth. Ztg." (*37*, 336), pure cholic acid may be prepared as follows: Evaporate 20 kilograms of bile *in vacuo* until it is reduced to 10 kilograms, add 2.5 kilograms of animal charcoal, and continue the evaporation until the whole solidifies on cooling. The mass is treated with 8 liters of alcohol at boiling temperature, filtered, and the residue washed with alcohol. The alcoholic liquors, filtered, are evaporated until reduced to 3 kilograms; to this is added solution of 15 kilograms of potassium hydroxide, and the mixture boiled for twenty-four hours, diluted with water, filtered, cooled, and the cholic acid precipitated by neutralizing the liquid with hydrochloric acid. The cholic acid is suspended in water, dissolved with ammonia, and solution of barium chloride added so long as it causes a precipitate; the precipitate is filtered out, the filtrate treated with hydrochloric acid, which again throws out the cholic acid. From the cholic acid thus obtained

Potassium Cholate may be prepared as follows: The cholic acid is dissolved in four or five times its weight of absolute alcohol, adding potassium hydroxide dissolved in absolute alcohol until a small quantity taken out no longer becomes turbid on the addition of water. The cooled solution is treated with twice its volume of ether when the potassium cholate is precipitated in the form of white needles; these are washed with a mixture of ether and alcohol, dried, dissolved in water, and the cholic acid precipitated by hydrochloric acid. The product is washed and crystallized from methyl alcohol.—Pharm. Journ., Sept. 5, 1908, 280.

MINUTES

OF THE

FIFTY-SEVENTH ANNUAL MEETING.

The Fifty-Seventh Annual Meeting of the American Pharmaceutical Association was held in the city of Los Angeles, California, beginning Monday, August 16, 1909, and continuing to Friday the 20th, inclusive. The headquarters of the Association were at the Hotel Alexandria, and the various sessions, with one or two exceptions, were held at Blanchard Hall, on Broadway. It has been just twenty years since the Association has last met on the Pacific Coast—at San Francisco, in 1889—and the welcome accorded by the pharmacists of the Far West in general and of California in particular was spontaneous, enthusiastic and sincere. The coming of the Association again to the "Golden State" had been looked forward to by the druggists of the great empire beyond the Rockies for several years past, and the splendid showing they made in point of numbers present at the meeting, their attendance upon and interest in the various sessions and lively participation in the discussions, formed a striking and gratifying feature of the meeting. The California State Association had just concluded its annual meeting, held likewise at Los Angeles in anticipation of the A. Ph. A. meeting, and practically all of its members remained to welcome the National body and take part in its deliberations. The opening session, as President-elect Rusby remarked, was "almost phenomenal" as to numbers present, and this was particularly noteworthy in view of the fact that, relatively, so few of the veterans from the Atlantic States were present, owing to the great distance to be traveled and the time and expense necessarily involved in making the long journey to California and back. The ravages of time were strikingly evidenced by the fact that only some three or four of those outside of the California members who had attended the San Francisco meeting in 1889 were present at the Los Angeles meeting in 1909. The beautiful "City of the Angels" fully sustained its reputation for sunny days and cool, delightful nights, and possessed manifold attractions in its nearby seaside resorts, lofty mountains, beautiful orange groves, stately palms and glorious wealth of

fruits and flowers. A delicate touch of sentiment was lent to the welcome accorded when a committee of ladies and gentlemen met the incoming visitors from the East and South twenty miles out from Los Angeles, in the midst of orange-groves and almond-orchards, with not only words of cordial greeting, but gifts of fruits and flowers. It was the experience of a lifetime for most of the members, and one never to be forgotten. The papers presented at the meeting before the several sections were timely, able and of unusual number, especially in the Scientific Section. The list of new members ran nearly up to four hundred, the largest in the history of the Association, and the membership is now twenty-five hundred, in round numbers, twice what it was ten years ago. Altogether, the meeting was a brilliant success, and it was made so very largely by the zeal and interest of the Western druggists.

First Session—Monday Afternoon, August 16, 1909.

The first general session was called to order at 3:30 P. M. by First Vice-President Eugene G. Eberle, of Dallas, Texas, in the absence of the President. Mr. Eberle stated that the time had now come for the opening of the Fifty-Seventh Annual Convention of the American Pharmaceutical Association. He said that under ordinary circumstances it would have given him exceeding pleasure to preside at this meeting, but at this time he was filled with sorrow and regret, because of the unavoidable absence, on account of illness, of the beloved President of the Association, Mr. Oscar Oldberg, of Chicago, whose wise counsel would be greatly missed by the Association. To the best of his ability he would endeavor to preside at the meetings of the Association, and he asked for the kindly consideration of the members during its deliberations.

The Vice-President stated that it was well that all great and important undertakings should be begun by asking the Divine aid, and he would therefore call upon the Rev. Warren F. Day, pastor of the First Congregational Church, of Los Angeles, to lead the Association in prayer. Mr. Day responded to this call, saying in substance that he was glad to ask a blessing upon the deliberations of such a body, and was thankful that largely through its efforts rational means were now employed in the alleviation of human suffering.

The Chair stated that in the unavoidable absence of the Mayor of the city, Hon. George Alexander, Mr. H. A. Peairs, one of the druggists of Los Angeles, would welcome the Association to this city. Mr. Peairs proceeded to do this in handsome style. He said he welcomed the Association as a body of men who had done more for pharmacy, and done more for the health and welfare of the people of the United States, than any other body of men in existence. He welcomed the Association in the

name of the Mayor of the City of Los Angeles, and offered the members everything in sight, from the mountains to the great ocean, and expressed the hope that they would enjoy themselves to the uttermost. He also expressed the hope that the members might be morally (?) benefited by contact with the people of the Golden State. Referring to the hot weather prevailing, he said the existing temperature was frigid in comparison with the warmth of feeling the pharmacists of the State of California had in their minds and hearts for the American Pharmaceutical Association. He extended a most hearty greeting and welcome from the citizens and druggists of Los Angeles, Southern California and the whole State.

The Chair stated that he would call upon a distinguished member of this Association to respond to the address of welcome just made—one who was known as an author as well as a pharmacist. He referred to ex-President John Uri Lloyd, of Cincinnati. Mr. Lloyd was greeted with a burst of applause as he came forward to speak. He began by saying that an informal response to an address of welcome was a very difficult thing for even an elocutionist to essay when he was not prepared, and he was not even an elocutionist. He assured the people of the city of Los Angeles that the pharmacists of America had deemed it a privilege to come to this city of the beautiful name—Los Angeles! none more beautiful—to hold their annual meeting. He predicted that this would be a red-letter week for the members of the American Pharmaceutical Association, to those who had the opportunity of attending the meeting in this most attractive city. He referred to the fact that he had visited this section some years ago, when Los Angeles was a small city, and he prophesied for the future that it would be a much greater city even than now—"extending clear to the ocean, that you have so recently made a part of the city of Los Angeles." Continuing, he said pharmacists are a working people—they delight in work, in their efforts to contribute to the welfare of humanity. "But," he asked, "are they getting the credit for the work they do?" They needed rest and recreation, like that they would have in Los Angeles during this meeting. He complimented the city of Los Angeles upon its advance in civic work, in patriotic home government, an example that the pharmacists of the East, North and South would doubtless be impressed by and carry back with them into their own sections of this great country. "Your mountains, your valleys, your deserts, your great ocean, your magnificent outlook that reaches in all directions," he said, "all these appeal to us; but not more so than the work you have done in the city of Los Angeles—the example you have set for other cities in other parts of the country to follow." He expressed thanks on behalf of the members of the American Pharmaceutical Association for the hearty welcome accorded them.

The Chair said he now had the pleasure of calling on one of the most distinguished citizens of the Golden State, an ex-President of this Associa-

tion, who desired to extend a welcome on behalf of the California Pharmaceutical Association. He referred to the veteran William M. Searby, of San Francisco. Mr. Searby was greeted with such thunderous and prolonged applause as he came to the rostrum to speak that it was impossible for him to proceed for some moments, and when he could do so, he said: "Mr. President, my work is done. They have done it for me. I could not talk like that. Like Mr. Lloyd, I am no orator, no elocutionist; but this is eloquent. This speaks louder than words, for that kind of action proceeds from an inward feeling. You have called upon me to give expression to that feeling, and I can only attempt to put in a few words the welcome which these friends here—these druggists of California and the Pacific Coast—have so much better expressed than I can hope to do."

Continuing, Mr. Searby said: "The California Pharmaceutical Association does, indeed, welcome most heartily the American Pharmaceutical Association to its own state. We are glad, indeed, after an interval of twenty years, to once more greet the Wise Men of the East, who have journeyed far to meet with the druggists of the great West, to shake our hands and look us in the face. We are glad to have you with us, that we may participate in some way in the work that you have been and are doing, and will still continue to do. Therefore, on behalf of the California Pharmaceutical Association, the pharmacists of California, and the entire pharmaceutical body, I give a most cordial welcome to the American Pharmaceutical Association." Mr. Searby said it was well to remember that it was no small matter for the American Pharmaceutical Association to come so far to hold its annual meeting. Some had come over 3,000 miles, and two members had come nearly 4,000 miles, at serious cost of money and valuable time. Nevertheless, it should not be forgotten that this is a great country and California is a great state. "We do not forget it," he said, "and we are sure you will not." California has very nearly five per cent. of the membership of the American Pharmaceutical Association, and once in twenty years it would be fairly entitled, upon that ratio, to have an annual meeting of the Association held within its borders. He claimed that it was only an act of justice, as well as courtesy, that the Association should come to the Pacific Coast once in twenty years. Their coming would be an inspiration to every pharmacist in California and the neighboring states. They would be uplifted by the presence of the American Pharmaceutical Association, and the work its members are doing. They were delighted that, notwithstanding all the expense of time and difficulty involved in making this long journey, the druggists of the West had finally succeeded in having the American Pharmaceutical Association undertake it, and they were more than pleased to have the Association with them to-day. Their hearts were rejoiced to have the members of the Association with them in annual convention assembled, and they welcomed them with all the heartiness befitting the occasion.

The Chair stated that the retail druggists of Los Angeles desired to present their greetings, and had selected as their spokesman the President of the Retail Druggists' Association, Mr. W. R. Dickinson. Mr. Dickinson responded to this call with warmth and spirit. He said it was an extremely agreeable duty to the President of the Los Angeles Retail Druggists' Association that he should have the privilege of addressing such an honored body of men, who were to be their guests during the fifty-seventh annual meeting of the American Pharmaceutical Association. He bade the Association welcome in the name of the four hundred retail druggists of Los Angeles, who extended that welcome with a loving heart. He said he wanted the members to feel that here was a happy and contented people, and that they would find rest and recreation among them. What was theirs was their visitors', and they wanted them to enjoy themselves to the fullest extent. Mr. Dickinson expatiated upon the prosperity of the people of California, and their happiness and satisfaction in life, and gave an apt illustration in the case of the man who had promised his mother to meet her in heaven, and when he had gotten thus far on the road he thought he had arrived at the golden gate of Paradise and stopped to wait for her here. He concluded by expressing the hope that the visit of the pharmacists of America to Los Angeles at this time would be so pleasant that they would wish to come again.

The Chair started to introduce to the convention one of its most distinguished members, in the person of Mr. Joseph P. Remington, of Philadelphia, to respond to the greetings of welcome so feelingly and handsomely made, but the applause that greeted Mr. Remington as he came to the rostrum was so deafening and prolonged that for some moments he could not proceed. When it had subsided, the Chair said that, as Mr. Searby had said a few moments before, the convention itself had expressed what he desired to say. Mr. Remington began by saying that he was called "F. H." in the little village in the East where he lived in the summer time, and that those initials stood for "Forlorn Hope." He said when there was an emergency of any sort, and they had to have a speaker for the town, or some one had to read a sermon, or somebody had to represent them at a fishing excursion, or a picnic, he was that "F. H." He said he was only asked a few moments ago to respond for the American Pharmaceutical Association, and he took a great deal of pleasure in doing so. He invited the members to center their minds for a few moments on the personality of William M. Searby, a man who, in season and out of season, had been working for years to get a meeting of the American Pharmaceutical Association in California again. The members would recall how he had urged this meeting in California, and he himself had taken a great deal of pleasure in seconding his efforts in that direction, and the Association was here to-day in consequence of the persistent efforts made to that end. Continuing, he recalled the time when he was in California a few

years ago, when the State Pharmaceutical Association was in a very unsatisfactory condition, but which condition had been greatly improved by the hope held up that at some time in the near future there would be a meeting of the American Pharmaceutical Association in California again. It had been of the greatest benefit to the State Association, and to the pharmaceutical associations of the Pacific Coast in general, and the American Pharmaceutical Association was here to-day to make good. They had traveled a long distance to come here and make the Western druggists feel they were a part of this great international body. This, he said, was the *American* Pharmaceutical Association—not a National Association, not a United States Association, but the *American* Pharmaceutical Association, which had members from South America, and Cuba, and Porto Rico, and Canada, and all over this country. It was therefore eminently fitting that the Association should meet on the Pacific Coast. He remembered that when he was out here he surprised some members by saying in a speech at a banquet that the reason of the condition in the California Association affairs was because Californians were very much in favor of California; that they had such a glorious country and were so happy here, that they forgot there were some forty-four other states in the United States. Subsequent results, however, had shown that they had come to appreciate the value of co-operating with the pharmacists from other parts of the country, and to believe in a national association, and this meeting here to-day was a proof that California was in the Union—that California was in harmony with the other states in the great progress that was going on in the beloved profession of pharmacy. Mr. Remington went on in a facetious vein to say that the members from beyond the Rockies had come to southern California to find beautiful roses and beautiful trees—eucalyptus and orange and others—and had found nothing at all *dry* but their river! and this had been explained by an enthusiastic citizen of Los Angeles, on the ground that it was because Los Angeles was a great distributing center, and that the river was doing service elsewhere, to the glory of the city of Los Angeles! (Laughter and applause.) He said he believed the pharmacists all over the country would feel that an added luster had been lent to pharmacy and the glory of the profession, that they had come here and found not only angels, but better than angels, for their hosts were human, in the best sense of that term.

The Chair called for greetings from sister associations, and asked if there was a representative of the National Association of Retail Druggists present. Mr. E. H. Ladish, of Chicago, responded to this call, and after stating that it was a privilege indeed to address so large and distinguished an audience, said he wanted to read the formal greetings of the Executive Committee of the N. A. R. D. which he did:

CHICAGO, ILL., *Aug. 10, 1908.*

To the Officers and Members of the American Pharmaceutical Association in Convention Assembled:

The Executive Committee of the N. A. R. D. extends to you most hearty and fraternal greetings and wishes you a largely attended and successful meeting.

In response to the very cordial and fraternal spirit manifested in the resolutions and coöperation and closer relationship brought by your delegates to the N. A. R. D. Convention at Atlantic City in 1908, we wish to emphasize these kindly expressions and sincerely hope that successful efforts may be made to hold contemporaneous meetings of the A. Ph. A. and N. A. R. D. in 1910.

The membership of these two bodies being so closely interwoven should indicate the value of endeavoring to promote better facilities and more general interest to induce a larger number of the members of the two organizations to attend contemporaneous meetings than would be probable by separate conventions.

While to some extent we are pursuing different channels in our efforts to uplift pharmacy, and bettering the conditions surrounding those engaged in its practice, yet our purposes and aims are so mutual that any efforts that can be made tending to strengthen these conditions should be commended.

With these thoughts uppermost in mind, we would suggest that renewed early efforts be made for a common meeting place of both associations, either through the Council of the A. Ph. A., or a special committee and the Executive Committee of the N. A. R. D.

Fraternally and respectfully yours, CHARLES MANN, *Chairman.*

T. H. POTTS, *Secretary.*

The Chair said he was sure the members appreciated these kind words from the representatives of the National Association. If possible, a closer feeling had sprung up between these two Associations, working along very similar lines, and both of them for the uplifting and betterment of the practice of pharmacy.

The Chair next called on the representative of the National Wholesale Druggists' Association, if one was present.

Mr. L. N. Brunswig was the accredited representative of this body, but he was not present at the moment, and Mr. Thomas P. Cook, of New York, spoke briefly for the National Wholesale Association. He said he had not been authorized to represent the Association as a special delegate, but he was glad to say the Association of Wholesale Druggists desired to express their fraternal greetings to this body, and that his only regret was that the accredited member of the Association located at Los Angeles was not present. On behalf of the Wholesale Association he wished the American Pharmaceutical Association a most successful meeting, expressed the hope that its deliberations would result in great benefit to pharmacy, and that the members would carry away with them the most pleasant memories of a delightful meeting in this beautiful city of Los Angeles.

The Chair called for greetings from the Army and Navy, and from other representatives of the United States Government, if any were present. Mr. Oscar Ruge, of the Navy Department, responded on behalf of that branch of the government service. He said he was sure that the

pharmacists of the Navy and the service in general remembered with appreciation the work that the American Pharmaceutical Association had done for them in the past. There was nothing of special interest pending with the pharmacists of the government service just at the present time, that the Association could help them with, but he felt sure that their help in the future in matters that might arise would be of great benefit.

The Chair then called on Mr. M. I. Wilbert, of Washington, D. C., to speak on behalf of the Marine Hospital and Public Health Service. Mr. Wilbert was greeted with spontaneous applause as he came to the rostrum to speak. He said he had been delegated by Surgeon-General Wyman, of the United States Public Health Service, to extend his felicitations and to assure the members of the American Pharmaceutical Association of his interest in the scientific work of the Association; also of his appreciation of the work that members of this Association have done in the service of pharmacy. As an illustration of his interest in the scientific side of pharmacy, the Surgeon-General, at the request of this Association that he take into cognizance the criticisms made on the National Formulary and embody them in a digest, had taken this matter up with the Trustees of the Pharmacopœial Convention, and also with the Secretary of the Treasury of the United States, and on his recommendation it was agreed that the forthcoming "Digest of Comments on the United States Pharmacopœia" should contain also a digest on the National Formulary. The Surgeon-General was deeply interested in the work for pharmacists in the Public Health and Marine Hospital Service, and recognized that many members of this Association had done yeoman service in the way of improving the financial and social status of these gentlemen. But, said Mr. Wilbert, there was one feature in connection with the Public Service that had been overlooked. He referred to the failure of interest that government pharmacists had shown in scientific work. It was unfortunate that much of the work of the pharmacists in the Government Service did not relate to pharmacy proper, because of the fact that this work was largely executive or clerical. On behalf of these pharmacists he asked that the committee of this Association on the status of pharmacists in that service be asked to co-operate with and assist the pharmacists actively engaged in the Public Service to help themselves, to improve themselves, and to take an interest in the scientific work of their profession, with the view of improving their own status, the status of pharmacy in the country at large, and the improvement of the health of the community in general.

The Chair expressed the pleasure that the members must have in thus hearing from the representative of the United States Public Health and Marine Hospital Service, and expressed the opinion that this was undoubtedly an important matter that had been alluded to, because if pharmacists did not see that the government provided for the advancement of the pharmacists in the various departments of its work they could not expect

to elevate pharmacy in commercial life. So it behooved pharmacists to see that their fellow-workers in the government service had their hearty support and aid in their work, thereby benefiting not only those engaged in that service, but the profession of pharmacy itself.

The Chair next called on Mr. Henry H. Rusby, of New York, President-elect of the Association, to address the convention, and hearty and prolonged applause greeted Mr. Rusby as he came to the rostrum.

Mr. Rusby said he felt like his predecessors who had spoken, that it was an inspiration to look into the faces of an audience like that before him, at the opening session of this Association. During the whole history of his connection with the American Pharmaceutical Association, he had never seen anything like it. It was almost phenomenal. The members from the East had expected something big, but nothing like this. He was reminded of the story told concerning some of the big trees of California, that they were so high that it took the united efforts of the father and mother and the oldest boy in the family to look to the top. Referring to the California Pharmaceutical Association, which was present in such large numbers and with such marked enthusiasm, he stated that it was a good match for the American Pharmaceutical Association itself. The American Pharmaceutical Association had come to the Pacific coast to help and to be helped, he said, and he only hoped that the Association would do its part as well as the California pharmacists had done theirs, with their magnificent showing of 750 members in attendance on the day before this Association met. He did not say it in any disparaging sense, but he thought there were many things that the people of the Pacific coast needed to be helped in—just as the pharmacists in other parts of the country needed it at the hands of the American Pharmaceutical Association. He gave one or two practical illustrations to show this, notably the case of certain venders of fruit-juices in San Francisco, who declared that they had tried to furnish the public of that city with pure fruit-juices and the people would not have them. "What does this mean?" the speaker said. "It means that there has been in this country such a condition of sophistication, of the people getting things falsely labeled, here and in every other part of the United States, that in the case of vanilla extract, for instance, they prefer the impure to the pure, because they have not been accustomed to getting the good article." Is that a desirable condition of affairs in the United States? The American Pharmaceutical Association had struck the final blow upon the wedge that gave to us the pure food law, and this Association was vitally interested in all these questions. It had come here to strengthen and improve the educational side of pharmacy. We have been claiming that pharmacists should be placed on the level, socially and professionally, with the physicians; and yet a distinguished member of this Association had said only last year that it was not proper to be done, because pharmacy was not on the proper plane of education. The Ameri-

can Pharmaceutical Association, not only its Section on Scientific Papers, but through its affiliated bodies, the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy, together with other associated bodies, had been endeavoring to improve this condition. Especially these three bodies working in harmony have undertaken to improve the educational status. Mr. Rusby felt sure that this improvement in material things with which pharmacists have to do, and the improvement in ethical standards resulting from these occasions when pharmacists come together and meet face to face, heart to heart and soul to soul, must redound to the advantage of professional pharmacy. He predicted that this would be one of the best and most successful and useful meetings this Association had ever known.

Mr. Remington, of Philadelphia, here stated that he would like to suggest to the Association that there was a lady present who formed a connecting link, as it were, between the past and present—between the past, when Professor P. W. Bedford was a member and the honored President of this Association, and the present, when his and many other names then well known in this Association had been forgotten by all save the older members. Professor Bedford, he said, was one of the greatest workers in the American Pharmaceutical Association, and had been both Secretary and President of the Association. Miss Cornelia Bedford, his daughter, was now in the room, and he asked that she be invited to attend the sessions of the Association and extend the privileges of the floor, as a mark of respect to the memory of her distinguished father. Mr. John Uri Lloyd, of Cincinnati, and Mr. Francis B. Hays, of New York, seconded this motion, and it was carried unanimously, and the Chair extended the privileges of the floor to Miss Bedford and invited her to address the convention, but her modesty forbade.

The Chair reminded the members that this Association had worked in the great cause of the elevation of pharmacy and medicine both with the American Medical Association, and said the Association would be glad to hear from the representative of that body.

Mr. C. S. N. Hallberg, of Chicago, had the honor to represent the Section on Pharmacology of the American Medical Association, and extended its hearty greetings. He began by saying that a good many years ago the American Medical Association had extended the olive branch—that is the way he supposed it ought to be put in California, he said—to the American Pharmaceutical Association, and through its Section on Pharmacology an interest was created in pharmacy which during the past few years had steadily developed, until to-day the American Medical Association, through its official organ, the "Journal"—the greatest medical weekly in the world, and one that reaches nearly every medical man in the country—and its various activities and functions, and especially its Committee or Council on Pharmacy and Chemistry, were constantly working to educate

the physicians to a better appreciation of pharmacy and a recognition of its standards, the Pharmacopœia and the National Formulary of this Association. Before the recognition of these two works as standards, strenuous efforts were made to interest the medical profession, but they were of little effect, because pharmacists did not have the medical sentiment with them. The average doctor thought it was simply a business question, and that of course the druggist would like to supply his own preparations because he could make more out of them instead of supplying those of the manufacturer; and so there was all of that question of selfishness in it. "It was not over two or three years ago when we succeeded," he said, "through this work in the Section on Pharmacology and by the practically united support of all the organs of medicine in the United States in supporting this movement, in bringing about a better condition. Not until that time did our efforts really begin to count." But within the last few years, supported by the local branches—which now exist in all of the larger cities in the East and the North and the West and the South—there has been locally a great change for the betterment of pharmacy, though there are many places yet where the pharmacists are working with physicians that prescribe proprietary medicines of the objectionable kind. This movement is not directed against the legitimate manufacturers, or against such articles of medicine as the pharmacists themselves cannot make, but more particularly against those compounds, mixtures and ready-made prescriptions which are the legitimate work of pharmacists and which have been taken out of their hands, and which within the last twenty years have practically gone away from them in many places so far as to make nothing but middle-men of the druggists.

Continuing, Mr. Hallberg said: "So we feel very much interested in this movement; and having followed it closely, we want especially to call the attention of the pharmacists upon the Pacific Coast to the importance of this movement, so that they may be posted when we get ready, and be so situated as to benefit by the establishment of two or three branches of the American Pharmaceutical Association on the Pacific Coast, to take up this movement and work it jointly with the local physicians. It is of tremendous benefit. It is a benefit, of course, to the physician, because it teaches him the value of these preparations that are uniform and reliable—as has been proved to be not the case with the vast majority of these proprietary articles. It saves the physician, in that when he prescribes these official medicines he ceases to become purely a peddler for the patent-medicine man. It benefits the pharmacist, because it restores to him the practice of pharmacy, which, without the compounding and dispensing of medicines, amounts to nothing. It benefits the wholesale druggist, because he has an opportunity to sell drugs and chemicals and get a fair profit, as opposed to the measly percentage he makes on proprietary articles. But best of all, it benefits the public; and the public in the long

run is, of course, the only people that deserve to be benefited. They get better medicines, and safer and better service, while the physician gets a better practice, and the pharmacist gets a better chance to practice his art.

So that we are especially pleased to report that, at the last meeting of the American Medical Association, and particularly in the section on Pharmacology, pharmacy came to the front as it never has before. There was one afternoon which was devoted to a symposium of discussion on the improvement of the Pharmacopœia and National Formulary. Remember, that while physicians are interested in the Pharmacopœia as a national standard, they are equally interested in the National Formulary. And it is because of the fortunate fact that the National Formulary was incorporated in the Foods and Drugs Act, thus receiving recognition equal to that of the Pharmacopœia, that we are able to offer to the physicians such a wide scope of medicine to day—much wider than we could do if only the Pharmacopœia was recognized. With the National Formulary, we have some 500 and odd preparations of the kind that the average doctor uses, and this, of course, extends the list much more largely than if it were confined to the simples alone. It is, therefore, of the greatest benefit to us. We must not forget this recognition of the National Formulary in the Pure Food and Drugs Act, and it was because of this fact that the interest in the discussion of the National Formulary in the section on Pharmacology of the American Medical Association was just as great as it was on the Pharmacopœia itself.

There was also a very interesting symposium on the biological side—the importance of a knowledge of these things by the pharmacists, so they can better serve the physician and the public. On the whole, it opens up a new era in pharmacy, to the extent that we can prove our ability, and show that we are competent and trustworthy to serve the physician and the public; and to that extent will our profession advance to a status equaling that of medicine. I believe, therefore, that the affiliation which has gone on between the American Pharmaceutical Association and the American Medical Association through the section on Pharmacology is one that is worthy of consideration, and also the fact that some of our well-known members can fill the offices in this section along with the medical men.

In conclusion, Mr. Hallberg said that the meeting of the American Medical Association was largely attended. Three hundred and sixty papers and addresses were read within three days' time, and without any evening session, the Association dividing itself into twelve sections, and working morning and afternoon, and only in that way could this tremendous amount of work have been accomplished. He offered this for the consideration of this Association as worthy to be copied. After working all day long, and especially in a latitude like this, it was certainly not too much to ask that the evenings be given over to recreation. On behalf of

the Section of the American Medical Association which, by a peculiar combination of circumstances, he had the honor to represent here, he extended to this association a hearty welcome, with the hope that its work and deliberations might result in the best efforts in the service of humanity.

The Chair said he was sure the Association appreciated these cordial greetings from the American Medical Association, and that all were grateful to Mr. Hallberg for his kind words.

The Chair here stated that he had inadvertantly overlooked one feature of the programme, which was a vocal solo to be rendered by Miss Willie Smyser, of Los Angeles, and he would now ask the young lady to thus favor the Convention. Thereupon Miss Smyser sang in a beautiful and cultivated soprano voice a solo in the nature of a patriotic anthem, "California—A song of the Golden West," which was heartily appreciated by the members, and upon which she received an *encore*.

The Chair next called for greetings from the Canada Pharmaceutical Association, and the General Secretary read the following letter of greetings from President Henry Watters, of that Association.

HOTEL DUNSMUIR, VANCOUVER, B. C., *August 9, 1909.*

The President and Members of the American Pharmaceutical Association, Los Angeles, Cal.

Gentlemen: The delegates to the Canadian Pharmaceutical Association in extra session assembled, met Mr. Bowman of Toledo bound for your meeting and take this opportunity to send fraternal greetings We wish you the greatest measure of success in your deliberations for the benefit of Pharmacy, a good time socially and good health for the term of your lives.

Yours fraternally, HENRY WATTERS, *President.*

J. D. TREMBLE, *Secretary-Treasurer.*

The Chair here gave opportunity to Mrs. Fletcher Howard, of Los Angeles, to make an announcement for the entertainment of the ladies on Tuesday evening, and also to Mr. Dickinson, President, of the Retail Druggists' Association, to call attention to the informal reception arranged for this evening by the Chamber of Commerce in honor of the visiting pharmacists, to be followed later by the President's reception in Blanchard Hall.

The Chair stated that the regular order of business now called for the reading of the President's address, and he would ask Mr. Harry B. Mason, of Detroit, to read this document, in the absence of President Oldberg on account of illness.

Mr. Remington, of Philadelphia, asked that before the reading of the address, he be permitted to present some resolutions bearing on the subject of the President's absence, and permission being granted, he read the following:

WHEREAS, The American Pharmaceutical Association has heard with deep regret that its President, Professor Oscar Oldberg of Chicago is prevented by illness from presiding at our annual meeting: be it therefore,

Resolved, That this Association tenders to its absent President its sincere sympathy, and expresses to him its high appreciation of his great services extending over the period of thirty-six years of membership.

Resolved, That this Association in forwarding these resolutions convey to its absent President, its heartiest wishes for his complete recovery and restoration to health.

Resolved, That the Secretary of this Association be directed to telegraph to Prof. Oldberg its regrets at his unavoidable absence.

These resolutions were seconded by Mr. F. C. Godbold, Mr. Francis Hemm, and others, and were adopted unanimously.

Mr. Mason, before reading the President's Address, took occasion to say that he was very sorry that Mr. Oldberg was not present to read his own paper, because when a man reads his own message to an audience his personality stands behind it, and he would give more weight and force to it. But, since President Oldberg could not be present and had asked him to read his address, he was very glad to render him this service.

Fellow-Members of the American Pharmaceutical Association:

Article IX of Chapter II of the By-Laws of our Association requires your President to "present at each annual meeting an address embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion." But I purpose, instead, with your permission, to discuss living questions of more immediate importance to you and to the life and work of our beloved Association.

You and I know that the history of the American Pharmaceutical Association has been one of great, unselfish, honorable achievement. We know this from participation in its annual meetings, and from the fact that those who have done most for the advancement of pharmacy in our country have all been members of this Association. Those who are not members have little or no opportunity to learn what it is and does, for the Association is doing nothing to inform them.

For my own part I regret to be obliged to confess that I never studied our Constitution and By-Laws and our published transactions until after I had been elected your President, and I believe it to be not improbable that our members generally are doing as I have done—deferring an examination of our code of laws until after they shall have been duly elected presidents.

In my efforts to perform my official duties I have sought light upon them by consulting the documents mentioned. I have also consulted my fellow-members. But I have often failed to find the information I needed. We transact our business apparently without difficulty, year after year, not because our methods are definitely settled, but because our intentions are the very best.

In accepting the office to which you elected me at Hot Springs, I appealed to all of you to freely give me your help and advice, and at the same time promised you that I would *not* follow all the advice I received. That promise I have faithfully kept.

I am sure that while our Association has always rendered great service, it may well be made more effectively useful than ever before, and *now* is the time to increase our efforts to be helpful to pharmacy, to our members, and to all loyal and true pharmacists, whether members of this Association or not.

THE PHARMACIST IS NECESSARY TO CIVILIZATION.

Believe me when I say that true pharmacy will exist as long as men live upon this earth.

We all know that there has been an enormous shrinkage of the distinctly pharmaceutical work formerly done by the American retail druggist. But we know the causes of that shrinkage, and must courageously set to work not only to save what is left, but to improve and extend our work.

Part of the work formerly attended to by the retail druggist is now done, and much of it better done, by manufacturers; but it is certain that some of that work may be recovered by us, so far as we are able to do it, and new duties are now demanded of us by the progress of medicine.

THE PUBLIC WELFARE DEMANDS THAT THE PRACTICE OF MEDICINE AND THE PRACTICE OF PHARMACY SHALL BE SEPARATE OCCUPATIONS.

Many medical practitioners have usurped the functions of the pharmacist and become dispensers as well as prescribers, and their course has been condoned by retail druggists who encroach upon the functions of the physician. But this unfortunate condition, too, will in time be remedied by a better understanding of the rights of all concerned.

There is no difference between a druggist who practices medicine and a physician who practices pharmacy.

The two professions of medicine and pharmacy are wholly distinct in all other countries. Any amalgamation of them is immoral, and liable to lead to dangerous abuses.

THE QUACK NOSTRUM EVIL.

Great havoc has been wrought by the quack-nostrum traffic which has debauched pharmacy; but there is good ground for the belief that the public, the medical profession and the pharmacists will soon unite in extirpating that enormous evil which exists nowhere except in our country.

I recommend that a brief and unequivocal statement, carefully and temperately worded, informing the public what patent medicines are, why they exist and the harm they do, should be prepared by a competent special committee of this Association, to be conspicuously displayed in the drug stores of all pharmacists subscribing to our code of ethics, in order that our attitude upon this question might be made known.

DRUGLESS THERAPY.

As a natural reaction from the terrible abuse of medicines, narcotics and stimulants has come the widespread and irrational fad of drugless therapy, which is destined to have its day as other fads have, but which must surely, in the light of science, purify pharmacy and leave it stronger than ever before.

THE PRESENT MISSION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

American pharmacy is, indeed, sick. Its symptoms of ill-health are many and pronounced, and never at any time before has it stood in greater need of the aid which the American Pharmaceutical Association can alone render. While the evils which beset the American retail druggist are intolerable, he has apparently done little or nothing to set them right. He must find out what is the matter with him and his business before he can adopt the right course of treatment for his troubles. Any rational man should be willing to devote an hour to a serious study of the conditions that make his whole life occupation unsatisfactory, and of the remedies proposed. Five members of this Association, constituting its Committee on National and State Legislation, made an analysis of these matters and reported their conclusions last September. Every retail druggist ought to read their report, which will be found in the Proceedings of the annual meeting of 1908. He should then do some hard thinking and decide whether he will become a

purely commercial dealer and give up altogether his privileges and duties as a pharmacist; or whether he will give up his extraneous side lines and devote his entire time and attention to the practice of pharmacy; or whether he will be wise enough to try to increase and develop his pharmaceutical practice and retain only so much of his purely commercial business as he may continue to do without defeating his ambition to remain a pharmacist. It is quite certain that the development of real pharmacy and a prescription business of value is impossible in the midst of surroundings that stamp it as a ridiculous pretense.

Your Committee on National and State Legislation of last year had earnestly hoped that its report could be widely circulated through one number of the monthly "Bulletin" of this Association to be sent not only to our members but to non-members; but our recommendation that this Association undertake such a campaign of education was not sustained. Notwithstanding this disappointing outcome, I am more than ever convinced that it is our duty to carry the gospel of the A. Ph. A. into every State Pharmaceutical Association and Board of Pharmacy and into as many American retail drug stores as we may be able to reach.

THE MOST POTENT CAUSE OF OUR TROUBLES.

The chief cause of the degradation of the retail drug business is the ruinously excessive number of drug stores. We have in the United States several times as many retail drug stores in proportion to the population as any other civilized country in the world. The total number is so great that if all the pharmaceutical work to be done were equally divided between them the share of each store would be ridiculously small. The inevitable consequence has been that one side line after another has been added to the really pharmaceutical operations. Even then the total volume of business is insufficient. If we could keep the number of drug stores within reasonable limits there would be enough business for all.

The pharmacy laws of other countries protect the public as well as the pharmacist by limiting the number of drug stores to that deemed necessary to insure to the public efficient, convenient and safe service and to each pharmacist an income consistent with the education and technical skill demanded of him by the law.

In our country we have already probably four times as many drug stores as can possibly be maintained in a state of wholesome efficiency. In addition we have as many more Registered Pharmacists armed with licenses to double the number of drug stores if they can raise a little capital to begin on. If your clerk is a Registered Pharmacist he may, if he will, seriously impair your prosperity by starting a new store across the street from you, taking with him a part of your customers although he fails in most cases to do enough business to make a living for himself. And yet we go right on manufacturing more Registered Pharmacists every year because the law or the Board of Pharmacy compels every retail druggist to either have a Registered Pharmacist as his clerk or to do business without any clerk.

The fact that druggists are unable to find satisfactory clerks in sufficient number is directly due to the pharmacy laws and their interpretation, for while we have more than twice as many Registered Pharmacists as drug stores, we have in some states no registered Assistant Pharmacists at all, or only a fraction of one for each drug store. And yet the rule seems to prevail in most of our states that the Assistant Pharmacist, who is licensed as competent to prepare and dispense all medicines, including prescriptions, must not be permitted to do so in the temporary absence of his employer, unless that temporary absence is limited to a few hours. This ruling would never be upheld by any court if the matter were presented in its true light, for the Assistant Pharmacist always and of necessity performs his duties without direct personal supervision in the presence as well as in the absence of a Registered Pharmacist.

This absurd rule is unheard-of in any other country.

The incontrovertible fact that there is a wide difference between the manager of a pharmacy and his clerk seems to be wholly ignored, and this is at the bottom of the excessive number of drug stores as well as the scarcity of clerks.

Registered Pharmacists hereafter licensed should be required to prove qualifications as much higher than those required of clerks, as their responsibilities are greater than those of their employees.

Assistant Pharmacists should be competent, practical dispensers; they need not be so highly trained as to be qualified managers, but they should not be treated before the law as if they were only apprentices.

The only effective remedy for the baleful continued increase of Registered Pharmacists is the recognition of the fundamental fact that actual education must be the real requirement for license, not mere successful cramming for an examination.

In other words, the only remedy which will be effective and meet the approval of all right-minded men is to amend our pharmacy laws by making graduation from a reputable school of pharmacy one of the necessary conditions prescribed for license to open or conduct a drug store. This remedy is ignored in all States except New York, Pennsylvania and Rhode Island, notwithstanding the fact that its application would increase the value of the license or certificate of registration now held by every Registered Pharmacist.

Already existing drug stores can of course not be legislated out of existence and Registered Pharmacists already licensed can not be deprived of their rights. It is not possible in our country to limit the number of drug stores according to population. But a great deal will be accomplished by stopping at once this licensing of insufficiently educated men to swell the excessive number possessing the right to open additional drug stores.

The assertion is frequently made that a stiff enough examination must be "something just as good" as the graduation requirement. It is a delusion. It is the actual discipline and educational development resulting from sufficient systematic courses of training and study, including adequate laboratory practice, which we must insist upon. The readiness with which the fresh graduate can answer questions can easily be imitated by any smart crammer.

We are heedless of the truth that the welfare of all is of far greater importance than the freedom of the individual to do as he wills. To permit irresponsible minors and educationally deficient persons to sell poisons and prepare and dispense medicines is like putting loaded revolvers in the hands of children.

LET US HAVE A CHANGE.

The public can have no proper appreciation of the importance and dignity of pharmacy in the face of the mongrel character of the business done in some of our intensely commercial drug stores. The importance of competent pharmacists is unheeded by the public and the medical profession because the public and the physicians have had little or no opportunity to see and learn what proper pharmaceutical service really is. It is buried in mercantile traffic.

It is a fact that the bulk of the trade of the average drug store is of the kind that may be freely carried on without a Registered Pharmacist's license, and that much of the dispensing and selling of medicines which can *not* be legally done without that license is of such a character that it requires no technical knowledge and skill.

We all know that the dispensing of physicians' prescriptions is restricted to Registered Pharmacists and their licensed assistants. But when this service is performed in a drug store where the sale of miscellaneous merchandise is cultivated to the utmost, and pharmacy is a negligible and neglected side-line, how is it possible that pharmacy can command any respect whatever?

Yet, I ask, how many of the intensely commercial retail druggists who speak derisively of the professional side of our occupation would be willing to be deprived of the right to prepare and dispense medicines prescribed for the sick? In the last analysis they will find that this is the only right belonging exclusively to the pharmacist, and that all the rest of the retail druggist's business belongs to everybody. There is great power in the real *raison d'être* of the pharmacist's profession properly understood and faithfully practiced.

PROPOSED REMEDIES.

The burdens of the drug business, largely due to the failure of the druggists themselves to discover and remove the real causes, have been so intolerable as to lead our brethren to eagerly try any remedy put before them with promises of relief. But the retail druggist should of all men be the last to pin his faith to nostrums. Let him cast aside all quack cures, secret formulas and make-shifts, and return to the good old standard remedies.

Some of the genuine remedies which should be adopted I have already referred to. But—first, last and all the time—let us aggressively and shoulder to shoulder press upon the attention of the public and the medical profession a true conception of the importance and value of the services of the pharmacist to his fellowmen. Let us compel them to accord to us the recognition and respect due to us. This can never be accomplished without determined, systematic, persistent work. The American Pharmaceutical Association should plan and lead this campaign of education and conquest. It will be successful if pharmacists individually believe in the righteousness of their cause, believe in themselves and their profession, respect their duties as well as their rights, and take pride in faithfully attending to every detail of their work, slighting nothing that makes it more nearly perfect.

Great injury has been inflicted upon the cause of pharmacy by those who, while engaged in the retail drug business, belittle its obligations. Great injury is also done by those who are so carried away by their love and admiration for the latest and most exact scientific methods that they have none left for the less brilliant but surely equally important care, skill and faithful attention to the daily routine work of the dispensing department.

Were I a practicing pharmacist, I would never employ an assistant who turns up his nose at the rule that the making of a perfect ointment must be held quite as important as the correct performance of an alkaloidal assay.

Every retail druggist who does slouchy pharmaceutical work of any kind stabs the art of pharmacy.

Let us respect our art. Let us respect and promote proper education. Let us prevent the admission of the educationally unfit into our craft. Let us rescue pharmacy from the deep shadow of commercialism.

THE PHARMACOPŒIA.

The Pharmacopœia of the United States has reached a high place among the pharmacopœias of the world. But while we have reason to be well pleased with its scientific character, I have become convinced that it might be made more helpful to the pharmacist than it is. The fact that it can be made so without in the least degree detracting from its other merits, seems to have escaped the attention of all of us.

The pharmacopœial directions, formulas and methods can in many instances be so framed as to encourage and facilitate the making of official preparations and the performance of other technical pharmaceutical work by the pharmacists. Little work of that kind is now done, because the official methods prescribed are less simple and convenient than they might be, or because no official directions are given. Formulas once in the Pharmacopœia have been dropped, a few at a time, because they were not utilized

to any considerable extent, until there are scarcely any working-formulas left except for the galenicals. I believe that pharmacists who have the ability and ambition to make such chemical and pharmaceutical preparations as do not require facilities beyond their reach, should find the requisite practical directions in the Pharmacopœia.

The pharmaceutical manufacturers have done very much for the progress of American pharmacy. Let us fairly and freely acknowledge our indebtedness to them. Let us freely recognize the fact that many chemical and pharmaceutical products of great value must of necessity always be made by the manufacturing laboratories. Let us go further and freely admit that the promising "propaganda in favor of U. S. P. and N. F. preparations," would be in great danger of utter defeat if competent pharmacists permit themselves to be held responsible for unfit products made and dispensed by the incompetent. Any retail druggist lacking the knowledge and skill required to make satisfactory U. S. P. and N. F. preparations, will be sure to do infinite harm to his own business as well as to the cause of pharmacy if he has so little sense as to try to make those preparations himself instead of procuring them from some trustworthy manufacturer.

But let us see to it that a fair chance is given also to the competent pharmacist.

I am sure that the value of many preparations which the pharmacist can *not* make has been greatly exaggerated, and that we have not been sufficiently on our guard to prevent an underestimation of the value of such pharmaceuticals as the pharmacist can readily prepare.

It should be freely admitted that it is very difficult for the pharmacist to manufacture fluidextracts and that he rarely tries to do so. But the value of that class of preparations is grossly exaggerated, and it is a serious mistake to encourage the use of fluidextracts for making other preparations.

Percolation is an exceedingly valuable and effective process for the extraction of the soluble matter of plant drugs, and every properly-trained pharmacist should know how to perform it and should make use of it whenever the results sought are best secured by its employment. But nearly all pharmacopœias have always ordered their tinctures made by maceration and still continue to do so. No experienced pharmacist can question the fact that any plant tincture of ten per cent. strength can be far more conveniently prepared by maceration than by percolation, and just as effectively.

The conclusion of the Brussels conference with regard to the employment of percolation must be regarded as not justified by the facts.

Numerous American retail druggists either buy their tinctures already prepared, or make them from fluidextracts, or prepare them by maceration regardless of the official directions. I am sure that a far greater number of our retail druggists would prepare their own tinctures if the Pharmacopœia should order them made by maceration instead of percolation, and if that be true, then it is sufficient reason for giving maceration the preference, or at least permitting it as an alternative process. As uniform tinctures as can be obtained have been made by European pharmacists by the process of maceration for generations.

The foregoing statements illustrate what I mean by seeking to encourage the rehabilitation of practical pharmacy through the official processes of the Pharmacopœia, and I strongly recommend that a special committee be appointed by the Council to investigate and report upon this subject in time for the next revision, or that our Committee on the United States Pharmacopœia be requested to give it attention.

WAYS AND MEANS.

How can the American Pharmaceutical Association get the funds necessary to undertake the great campaign of education which shall rehabilitate our profession?

By increasing our membership, since that is our only source of revenue.

Fortunately our membership requirements do not exclude co-workers who do not

happen to be retail druggists in business. We extend a most hearty welcome to all who are interested in the art of pharmacy or in the sciences upon which that art must depend, including scientific men, educators and others who may not be practicing pharmacy at all. We need them. To exclude them or to spurn their unselfish aid would result in the rapid degeneration of our art.

There can be no question about our ability to increase our membership if we adopt energetic and proper methods. Our local branches can do much, and we should increase their number and stimulate their activity. There are over one hundred American cities each having a population of over 100,000. Systematic plans for starting local branches should be devised and carried out. I recommend that our Committee on Local Branches be made a standing committee and that the necessary ways and means be thought out by that committee. In their activities the local branches should give precedence to the discussion of new remedies, formulas and methods of preparation. They should *not* give so large a share of their attention to purely economic questions as to create in the public mind the impression that the pharmacist is chiefly a commercial shop-keeper. The retail druggist should see the unwisdom of everlastingly discussing combinations to maintain prices and to increase the volume of his business.

Let the local branches invite physicians to attend their meetings, and abstain from offering those physicians unsolicited advice on therapy.

I have seen printed circulars sent to physicians by retail druggists pronouncing certain drugs as being particularly valuable for certain purposes, and certain N. F. combinations of these drugs as especially deserving the favorable consideration of the busy practitioner. I have seen and heard utterances which hinted at the desirability of coalitions or gentlemen's agreements between doctors and druggists for mutual economic advantage. That kind of talk must be resented by all right-minded men. If such offences are frowned down the "get together" meetings of physicians and pharmacists will be productive of great good.

THE NATIONAL FORMULARY.

It is remarkable that the Congress of the United States should have made a legal standard of the National Formulary prepared, owned and published by an association which has the power to change its book any day, or to reduce its scope or add to it, or suspend its publication altogether. It was a ridiculous mistake which will, of course, be corrected sooner or later.

The National Formulary has been held up to scorn on account of the absurd character of some of its preparations, and the compilers have been severely criticised. But it must not be forgotten that these grotesque polypharmacal preparations were included solely because they are prescribed by many medical practitioners, and before the book had become a legal standard.

It is to be hoped, however, that some limit will be placed upon the extent to which complex preparations are included on the sole ground that they are actually used.

There should be no complex therapeutic mixtures whatever in the Pharmacopœia. All preparations of that class now contained in it should be transferred to the National Formulary, if not excluded from both.

I once heard a high authority on pharmacy describe the composition of compound cathartic pills as a "veritable poem." Such a characterization of that preparation seems to me to be a new and unique species of poetic license. Is it a spring poem! If the National Formulary retains its authority as a national standard, the sole control of it will pass out of the hands of the American Pharmaceutical Association. It will then perhaps be considered as a supplement to the Pharmacopœia, and in that case will no longer contain such inspirations as Warburg's Tincture, Plummer's Pills, etc.

But, whatever may be the fate of the National Formulary, we shall always find a for-

mulary for unofficial preparations necessary, and this Association will prepare and publish it.

OUR PUBLICATIONS.

We have proudly and justly claimed that our annual Report on the Progress of Pharmacy is worth much more than the annual dues which our members are required to pay. This argument has enabled us to secure many new members. But if we are to be as successful, prosperous and useful as we ought to be, we must offer greater inducements to our fellow pharmacists to join our Association.

If practicable our monthly Bulletin should be sufficiently enlarged to take the place of our annual volume of Proceedings, and should give additional fresh and timely information of practical value to pharmacists.

The value of the splendid work of our Reporter on the Progress of Pharmacy is greatly diminished by the rule that it must cover a whole year before it is published. Last year some of the information it contained was about twenty-two months old when it reached our members, and none of it less than ten months old. The Report on the Progress of Pharmacy should be a monthly report and published in our Bulletin.

As our funds are limited, it is necessary that we should use them to the best advantage. It seems to me that we ought not to include in the Report on the Progress of Pharmacy any information that does not apply directly and specially to our own professional-technical work.

Let us leave pure science to other scientific bodies.

We cannot afford to duplicate work that is done by and properly belongs to the American Chemical Society. Only a small number of our members find it necessary to keep pace with the progress of pure chemistry, or of any chemistry except that made use of for pharmaceutical purposes. The chemists of our Association use the publications of the American Chemical Society.

What our Association should do is to make our Report on the Progress of Pharmacy as complete and useful as possible to the great majority of our members by devoting all of it to applied pharmaceutical chemistry, pharmacognosy, pharmacy, and such other information as they have practical use for. In order that it may be possible to make the Report on the Progress of Pharmacy a monthly one, the work should be done by a committee of five: the chairman and four associates. The four associates should be one reporter on inorganic chemistry, one on organic chemistry, a third on materia medica, and a fourth on pharmacy.

Among the valueless matter now included in our Report on the Progress of Pharmacy I find accounts of the annual meetings of the State Pharmaceutical Associations which the Reporter is required to give. Since these accounts cannot be made sufficiently extended to be of any value they should by all means be omitted.

Altogether I find that we can advantageously reduce the size of the Report on the Progress of Pharmacy about one-third if the suggestions here made are accepted.

One great advantage of publishing in our monthly Bulletin all of the transactions, reports and papers of our annual meetings is that they would then be in the hands of our members several months earlier than is possible under the present system.

The volume of our Proceedings for 1908 contains 1,200 pages. Twelve numbers of our Bulletin contain 384 pages. But I feel sure that a total of about 1,200 pages will be sufficient to contain all of the matter which our Association ought to print. We cannot afford to do more until we shall have determined by actual trial what is best.

We should publish in every number of the Bulletin one page giving a brief statement of what our Association is, what it is doing for its members, and how those so disposed can join our body. It should also give brief monthly reports on the drug market—not "prices current," but items of such importance as any great change, actual or prospective, in the supply of individual drugs, the appearance in the market of spurious, adulter-

ated or damaged drugs, and other like information. New remedies, such as the so-called synthetics, should be reported upon, giving reliable information as to their composition, the indications in regard to the probable prospective demand for them, their price, general properties and doses, etc. Reviews of new books of interest to pharmacists should also be published in the Bulletin. Also proposed new legislation, and news and statistics of importance.

Editorials, personal opinions, political questions upon which members may not agree, and any matters of no importance to the Association as such, or upon which the Association has not passed judgment, should be carefully omitted. In other words the Bulletin should as far as possible be a mere record of facts, official communications and reports, and the formal acts of the Association and its committees.

Much information of importance which should be found in our Proceedings is omitted from that volume, evidently because we have not stopped to reflect upon it. We have simply followed our own precedents.

We have several trust funds and other funds, but I have failed to find out how some of them originated, their purpose, etc. The Ebert fund is useless unless information is easily accessible, stating the conditions upon which the prizes are awarded. I see a mention of a Motter prize, but am unable to find out what it is.

If the matter now published in our annual volume of Proceedings were printed in the "Bulletin," the monthly numbers can of course be bound at the close of each year into one volume, which would then constitute the continuation of our set of the Proceedings.

I am informed that the postal laws do not prevent us from making each number of the monthly "Bulletin" as small or as large as we may elect. It costs no more to publish 1,200 pages in twelve parts than in one volume. We would therefore save the present cost of printing the "Bulletin" and the cost of binding and distributing the Proceedings. Should we find that 1,200 pages are insufficient they can be increased.

One number of the "Bulletin" might contain the Constitution, By-Laws, Code of Ethics, By-Laws of the Council, Rules of Finance, Lists of Members, Officers and Committees, Financial Reports, information concerning our various funds, archives and other property. Another number can be devoted to the transactions at our annual meetings. Another to the papers read at those meetings. Another number might contain all useful statistical information gathered by our committees, including lists of members of the Boards of Pharmacy, and officers of State Pharmaceutical Associations, together with any other suitable matter required to make that number not too small. No valuable matter now being published should be omitted. The proceedings of the local branches and of the Council should be recorded.

Whenever any number of the "Bulletin" is devoted to a very complete record of some special subject of importance, it will be unnecessary to afterwards repeat it. It can instead be referred to for full information whenever required.

But all these matters must be carefully planned by a special committee appointed by the Council.

COMMITTEES.

Our committees need revision. There can be no need of five different committees giving attention to legislative matters, two committees on membership, etc. I am persuaded that we have several committees which we ought *not* to have, as for instance, those on Parcels Post and on the Status of Pharmacists in the Service of the Government, and that there are several very important committees not on our list which we should have.

We should be able to find readily in our publications all the committees we *do* have, when or how each was established, by whom it is appointed, and the number of members of which it consists, together with a definite statement of its duties and powers, and when and to whom it must report.

The committees we now have are appointed by the President or by the Council, but some of them have been sometimes appointed by one and sometimes by the other, and all of them seem to be expected to make their report not to the authority which appointed them, but direct to the Association. Indeed we have committees apparently clothed with power to act for the Association without any control, which is, to say the least, an unusual practice in well-ordered organizations. In one volume of the Proceedings I found that an "auxiliary committee" of this Association had been ordered to consist of officers of state associations who may or may not be members of our body.

These matters can, of course, be set right after attention has been called to them, but not before.

It should be the settled policy of the American Pharmaceutical Association, being a body of scientific-technical specialists organized for the purpose of promoting the best interests of pharmacy and pharmacists, to confine its activities to the definite objects for which it exists, and to take no part in the settlement of questions and problems which do not concern us as an Association, however much they may interest us as individuals. Political and purely economic questions should be carefully avoided unless they very clearly and specifically concern our definite aims.

In all such matters our Association should be guarded. Upon questions of national policy the opinions of our members are sure to be much divided, and as such questions should be settled upon wholly unselfish, patriotic grounds, we participate in the discussion and disposition of them as citizens, and not as pharmacists or as members of this Association. For my own part I am heartily in favor of the Parcels Post because I am convinced that it would be of great benefit to the whole people, and that the evils predicted as likely to result from its introduction are imaginary or can be prevented. It will doubtless be established sooner or later, and its present opponents will then probably completely change their minds in regard to it. It is not a pharmaceutical question.

The question of patents and trademarks is *not* a purely economic question, but concerns justice to the sick.

With regard to the question of the status of pharmacists in the service of the United States I deem it my duty to say that having been at one time connected with one of the medical branches of the government I feel sure that nothing is to be gained by advice to the head of any department concerning the rank and pay of his subordinates. No one knows this better than those subordinates themselves, who become insubordinates whenever they violate department regulations by taking any part in such advice or interference. The recurrence year after year of the efforts of this Association to interfere in such matters is in my opinion unwise.

The uniform attitude of our Association in all its intercourse with various branches of the government should be such as to promote cordial relations with them. The heads of the medical branches of the government service know the actual conditions in their respective departments better than we, and are seeking to improve them as rapidly as circumstances permit when improvements are needed. I have held these views always, but as your President I cannot continue to be silent without shirking my duty as I see it.

All committees appointed to perfom duties requiring the services of technical experts or of men of special knowledge or experience should be appointed by the Council.

All committees required to represent the Association before officers of the executive departments of the government or before committees of the Congress should be appointed by the Council, from which they should receive their instructions, and their reports should be submitted to the Council not less than two months preceding the annual meeting of the Association whenever possible.

Among the Standing Committees which it seems to me we should have are committees on:

1. Education (including educational statistics. Appointed by the Council).

2. Legislation (to report changes and proposed new laws, but not empowered to propose, advocate or oppose bills in Congress or State Legislatures except under specific instructions from the Council by which it should be appointed).

3. Statistics of Pharmacies and Pharmacists. (Registration statistics and Board of Pharmacy operations. To be appointed by the Council.)

4. Relations of the Pharmacist to the Public Health and to the Medical Profession (appointed by the Council).

5. Membership (appointed by the Council).

6. Local Branches (appointed by the Council).

7. Finance (appointed by the Council).

8. Publications (appointed by the Council).

9. Progress of Pharmacy (appointed by the Council).

10. The Pharmacopœia (appointed by the Council).

11. The National Formulary (appointed by the Council).

12. New Remedies (appointed by the Council).

13. Drug Market (including statistics of importation, etc. Appointed by the Council).

14. Drug Reform (including "U. S. P. and N. F. Propaganda." Appointed by the Council).

15. Standards for Non-Official Drugs and Chemical Products (appointed by the Council).

16. Historical Pharmacy (appointed by the Council).

17. Prizes (appointed by the Council).

18. Time and Place of Meeting.

19. Transportation.

We should have Special Committees on:

23. Endowment Fund (appointed by the Council).

24. Procter Memorial Fund (appointed by the Council).

25. Centennial Fund (appointed by the Council).

26. Pharmaceutical Collection at the National Museum.

27. Metric System.

Other special committees to be appointed as may be ordered by the Association.

Necessary committees of the Council to act upon business of the Council are not included in this list.

SELECTION OF OUR OFFICERS.

When we consider how our Nominating Committee is constituted, each State and Territory having equal representation whether there be one member or hundreds of members in each, I am surprised that the Association is able to select such good presidents as we are having. But it seems that whole delegations present at our last meeting knew what they wanted, for each of some of them voted as one man, as, for example, New Mexico.

IN CONCLUSION.

I sincerely pray that you will forgive me if I have been too presumptuous in my criticisms and suggestions. They are prompted by a sincere desire to be useful to our beloved Association, and any errors I have committed are errors of judgment, for my heart is right. May our Association long live and prosper!

SUGGESTIONS REGARDING OUR CONSTITUTION AND BY-LAWS.

They need revision. A Committee should be appointed by the Council to report such changes, if any, as may be deemed necessary. The following notes may be useful in that direction:

Article I of the Constitution should set forth the objects of the Association in clearer terms.

Article III. Instead of one Reporter on the Progress of Pharmacy we should have several—one on Inorganic Chemistry, another on Organic Chemistry, a third on Materia Medica and Pharmacognosy, and a fourth on Pharmacy. There should be, in other words, a Committee on Progress of Pharmacy consisting of five members, the fifth to be its Chairman. Should this change be made Chapter VI of the By-Laws will also require revision.

By-Laws.

Chap. I, Art. V. This seems to be a repetition of Art. III of the Constitution.

Chap. II, Art. IX. The President should not be required to embody in his annual address the "general scientific facts and events of the year." He should discuss questions bearing upon the affairs of the Association.

Chap. IV, Art. II. The Local Secretary's duties should be limited to local arrangements for annual meetings under the direction of the General Secretary and the Council.

Chap. V, Art. III. Is it wise to publish lists of members dropped for non-payment of dues? See pp. 1178 to 1182 of Proceedings for 1908.

Chap. VI, Art. II, III and IV. These articles should be re-written. Too much is demanded of the Reporter. An introduction or synopsis of the report should *not* be required.

Chap. VII, Art. II. The Council is too large to be able to transact ordinary routine business sufficiently promptly. There should be a Business Committee of the Council for that purpose. Section Chairmen should not be members of the Council.

Chap. VII, Art. VIII, Sec. 2, is in conflict with Art. II of Chap. VIII. If a two-thirds vote is sufficient to recommend a candidate for membership, why should a three-fourths vote be required to make him eligible ?

Local branches should have the power to elect members, collect their first year's dues, and make reports to the Secretary of the Council.

Sec. 3 of Art. VIII of Chap. VII is impracticable.

Chap. VIII, Art. I, needs reconstruction.

Chap. VIII, Art. III, is in conflict with Chap. V, Art. III. If a member is *liable* to be dropped on account of non-payment of dues for two years, why should he not be reported until he owes for three years ?

Chap. IX, Art. XIII, Sec. 3, should be amended. States and territories having less than six members should not have as much voice in the nomination of officers as those having hundreds.

Chap. X, Art. I, needs radical change.

Chap. X, Art. II and VIII. A Committee of the A. Ph. A. should not propose programs of business to other associations.

The Chair called for action upon the address of the President just read, and Mr. Hallberg moved to refer to a committee of three, to be appointed by the Chair, to consider and report at to-morrow morning's general session. This motion was seconded by Mr. Hemm, and others.

Mr. Remington stated that Mr. Oldberg had written him that if the Association were willing to consider the idea, he would like to counsel with the committee that might be appointed, and would prefer that his address be referred to the Council, as there were some matters in it which would require careful consideration and would have to pass over for several months, and possibly be discussed. If not contrary to the rules of the

Association, he would like to see Mr. Oldberg's wishes in this respect carried out, in view of the fact that he was not able to be present; therefore, if no harm would be done by pursuing this course, he would like to move a reference of the address to the Council.

The Chair said he could see no objection to this, but there was a motion before the house now, and this would have to be an amendment to that motion, or offered as a substitute for it. Mr. Wilbert said if Mr. Remington would offer his motion as a substitute he would second it, and Mr. Remington said he would do that.

Mr. F. W. Meissner, suggested that if the committee were appointed it would undoubtedly receive the suggestions of any member of the Association regarding the temporary disposition of the President's address, and he thought the original motion should prevail.

Mr. Mason said that he had called to see President Oldberg as he came through Chicago on his way to this meeting, and that the President desired him to say to the Association, if necessary, that he had given these matters discussed in his address a great deal of thought, and that he had a great deal of additional information and data which he felt could not be included in the address, because it would make it too long; that he would therefore like to be able to counsel with the committee appointed, and lay before that committee these additional facts. Mr. Mason, himself, thought that, in view of the fact that the President was making a good many recommendations in his address, some of them very radical in their character, and requiring a good deal of consideration and thought, the wise thing to do would be, not to appoint a committee to act in the regular way at this time, to bring in a report to-morrow morning or at Friday afternoon's session; but to give a year's time for consideration of these recommendations, and have a committee, preferably appointed by the Council, to act upon them and report at the next annual meeting. This was simply his opinion, however, and it was for the Association to do what it saw fit in the matter.

Mr. Hallberg, spoke in opposition to this suggestion. He said there was a certain position taken in this paper that was of vital interest to this Association, and there should be an expression from the American Pharmaceutical Association at the very earliest moment on this vital question. He held that it could not be left until the last day of the meeting here; that it must be acted upon as soon as possible. It concerned the most important thing this Association had to do with—the most valuable thing the Association had, in every respect; and that not on account of the few dollars that it contributed, but because it concerned every retail druggist in the United States; that it went to fundamental principles, and gravely affected the most valuable work of the National Association of Retail Druggists. The Association, he said, should have an expression on this proposition at the earliest possible moment; therefore, it was necessary

that a committee be appointed to pass on this question and report to-morrow morning. If there were other things in the address which required further consideration and deliberation, he said, the committee might recommend that these be referred to the Council. He insisted that the regular course be followed in this matter, and that the address should be referred to a committee, which should report its conclusions to the convention, and not to the Council. He hoped the substitute motion would be voted down, because the Association must have a report upon this vital question at to-morrow morning's session.

Mr. Bowman spoke briefly in advocacy of Mr. Remington's position.

Mr. Charles M. Ford asked as a matter of information if the proceeding was regular as embodied in the motion of Mr. Remington, that the address be referred to the Council. He said that in all such meetings he had ever attended it had been customary to refer such documents to a committee then and there appointed by the Chair, unless otherwise provided for, and he thought if the by-laws of this Association required the address to be referred to a committee no substitute could be entertained. The Chair expressed the opinion that there was no such by-law requirement, but it was simply a custom that had never been deviated from.

Mr. Remington, replying to Mr. Hallberg, said that if the address were referred to a committee of the Council, it must eventually be referred back to the Association for final action. The only difference was, that in one case the Association would act hastily and without due consideration, while in the other there would be ample time to consider well the proposed radical changes in the Constitution and By-Laws. He said he did not know just what Mr. Hallberg referred to as being such a vital question that it must be acted upon immediately; but if the question was so important as that he would suggest that question be acted on now, leaving other matters involving changes in the Constitution and By-Laws for mature consideration by the committee, in co-operation with President Oldberg, who had given so much time and thought to them, the committee then to report to the next annual meeting. In any event, the Association itself must pass upon the recommendations of the President. He thought Mr. Oldberg was actuated by consideration for the best interests of the Association and for the very reason that he did not wish to have his ideas accepted by the Association hastily, he desired an opportunity to advise with the committee that might be appointed. He was inclined to agree with the suggestion of Mr. Mason that this committee might be appointed with direction to take up and report upon such suggestions as might be proper to report upon at this time—including perhaps the very question Mr. Hallberg considered as so vital—giving expression of opinion to their views, leaving other questions dealing with proposed changes in the Constitution and By-Laws to be referred to the Council for consideration. He was perfectly willing to withdraw his motion to refer to the Council exclusively, and would be agreeable to the suggestion indicated.

Thereupon Mr. Wilbert withdrew his second to Mr. Remington's motion.

The Chair stated that the substitute motion had been withdrawn, and the original motion of Mr. Hallberg was before the house. Upon this motion he invited remarks.

Mr. Hallberg again stated the effect of his motion, which was, that a committee of three be appointed by the Chair, to report at to-morrow morning's session on such suggestions or recommendations of the President's address as it might be able to report upon, this matter to be left in the discretion of the committee.

Mr. R. H. Walker, wanted to know how a committee could duly consider and intelligently report in the limited time allowed upon suggestion or recommendations that it had taken twelve months for the President of the Association to work out. The Chair suggested in reply to Mr. Walker that the motion was, that the committee should pass upon such matters only as they were able to pass upon at this time, and that all other matters be referred to the Council. Mr. Hallberg agreed that this was a correct statement of his motion.

There were calls of "Question!" upon the Hallberg motion as made, and the Chair put it to a vote and it carried. The Chair stated he would wait a few minutes before appointing this committee, and other work would be taken up that the Association has before it.

Mr. Searby, of San Francisco, was here given opportunity to extend a cordial invitation from the pharmacists of San Francisco to the visiting members returning homeward in that direction to stop over in San Francisco and be their guests and the recipients of their hospitality and entertainment, promising to show them a "brand-new San Francisco." Mr. Searby warmly supported this plea of the pharmacists of his home city that they be permitted to entertain the members from the far-distant sections of the country who would be returning that way, and promised them automobile rides; an entertainment at San Francisco's celebrated "Cliff House," located on the Pacific Ocean at the entrance of the "Golden Gate;" a trip to the top of Mount Tamalpais, over eight miles of the crookedest and most precipitous railroad in the world, and other experiences of a delightful and enticing nature. Mr. Searby also extended a cordial written invitation from the ambitious and progressive city of Oakland, San Francisco's neighbor across the Bay, to the members to visit their city upon their homeward journey, promising to do much for their entertainment and happiness, if they would do so.

As the next order of business, the Chair called for a report from the Committee on Credentials. Mr. H. M. Whelpley, moved that this report be postponed until to-morrow, as there was considerable work yet to be done at this session, followed by a meeting of the Nominating Committee upon adjournment. Mr. Remington suggested that the hour was now about six o'clock, and he also favored deferring the report of the Com-

mittee on Credentials until the next session. The Chair put the motion accordingly, and it carried.

The Chair stated that the list of standing and special committees would be called now, as notice to the chairmen to have their reports ready by to-morrow morning's session. The General Secretary then called the list of the following committees:

STANDING COMMITTEES OF THE ASSOCIATION.

Committee on U. S. Pharmacopœia.
Committee on National and State Legislation.
Committee on Transportation.
Committee on Time and Place of Next Meeting.

SPECIAL COMMITTEES OF THE ASSOCIATION.

Committee on Organization of Local Branches of the A. Ph. A.
Committee on Proposed Pharmaceutical Collection at Washington.
Committee on William Procter, Jr., Monument Fund.
Committee on Publicity.
Committee on Reorganization.
General Committee on Membership and Reception.
Committee on Weights and Measures.
Committee on Status of Pharmacists in the Government Service.
Committee on Parcels Post.
Committee on The Bulletin.
Committee on Patents and Trade-Marks.
Committee on Drug Reform.
Committee on Drug Market.
Committee on The National Formulary.
Committee on Standards for Non-official Drugs and Chemical Products.
Delegates to the Section on Pharmacology of the American Medical Association.
Delegates to the National Association of Retail Druggists.
Delegates to the National Wholesale Druggists' Association.

The Secretary stated that all these committee reports were in order, and would be called for at to-morrow morning's session in the order in which he had announced them. He asked that the Chairmen kindly take notice and have their reports ready.

The Chair stated that he would appoint as a Committee on President's Address the following: William M. Searby, of San Francisco; Martin I. Wilbert, of Washington, D. C.; C. S. N. Hallberg, of Chicago.

The Chair here declared a recess of five minutes, to enable the members present from the various states, territories, island possessions and provinces of Canada to select their delegates upon the Nominating Committee, now in order to be named. After the recess the Secretary called the roll of the various states, territories, etc., and the Nominating Committee was made up as follows:

For Arkansas—W. L. Dewoody and J. B. Bond.
For California—A. Schneider and Miss Roehr.
For Colorado—C. H. Skinner and S. L. Bresler.
For District of Columbia—L. F. Kebler and M. I. Wilbert.

For Florida—W. O. Richtmann and E. Berger.
For Georgia—Geo. F. Payne.
For Idaho—T. M. Starrh.
For Illinois—E. H. Ladish and C. S. N. Hallberg.
For Indiana—F. W. Meissner and A. F. Sala.
For Iowa—Mrs. F. Howard and G. Scherling.
For Kansas—M. R. Mason and W. J. Frazier.
For Louisiana—F. C. Godbold and Philip Asher.
For Maryland—John A. Davis.
For Massachusetts—E. H. La Pierre and E. O. Engstrom.
For Michigan—L. A. Seltzer and J. M. Francis.
For Missouri—H. M. Whelpley and Otto Claus.
For Montana—C. E. F. Mollet.
For Nebraska—A. V. Pease and E. L. Dort.
For New York—J. A. Dunn and A. J Cohn.
For North Carolina—E. V. Howell and F. B. Hays.
For North Dakota—H. L. Haussamen and W. S. Parker.
For Ohio—B. H. Overbeck and J. H. Beal.
For Oklahoma—J. C. Burton and F. B. Lillie.
For Oregon—J. M. A. Laue and Geo. C. Blakeley.
For Pennsylvania—F. P. Stroup and J. W. England.
For Tennessee—W. R. White.
For Texas—E. G. Eberle and R. H. Walker.
For Vermont—W. S. Terrill.
For Virginia—James L. Avis.
For Washington—C. W. Johnson and C. Osseward.
For the Association at Large—J. P. Remington, of Pennsylvania; Chas. M. Ford, of Colorado; Jno. G. Godding, of Massachusetts; Harry B. Mason, of Michigan; Wm. M. Searby, of California.

On motion of Mr. Whelpley, the Nominating Committee was ordered to meet immediately upon the adjournment of this session.

There being no further business before the Association at this time, an adjournment was taken to to-morrow (Tuesday) morning, at 10 o'clock.

Second Session—Tuesday Morning, August 17, 1909.

The second general session was called to order by First Vice-President Eberle at 10:30 A. M., and as the first order of business the Secretary was called on to read the minutes of the first session, which he did. No correction being offered, on motion of Mr. Claus, seconded by Mr. Cook, the minutes were adopted as read.

The report of the Nominating Committee was called for, and the Secretary read the report as follows:

REPORT OF THE NOMINATING COMMITTEE.

Los Angeles, Cal., *August 16, 1909.*

To the President and Members of the American Pharmaceutical Association:

Gentlemen: The Nominating Committee begs to report that it organized this evening by the election of Foress B. Lillie, of Guthrie, Okla., as chairman and Chas. M. Ford, of Denver, Colo., as secretary, and after reading the by-laws governing the work of the

committee, proceeded to the selection of nominees for the offices of president, three vice-presidents, and three members of the Council. The following names are respectfully submitted for your consideration:

For President—Eugene G. Eberle, of Dallas, Tex.; Chas. M. Ford, of Denver, Colo.; John G. Godding, of Boston, Mass.

For First Vice-President—Wm. B. Day, of Chicago, Ill.; Foress B. Lillie, of Guthrie, Okla.; Chas. L. Wright, of Webb City, Mo.

For Second Vice-President—Ernest Berger, of Tampa, Fla.; Otto F. Claus, of St. Louis, Mo.; John M. A. Laue, of Portland, Ore.

For Third Vice President—Edward L. Baldwin, of San Francisco, Cal., Wm. R. Dickinson, of Los Angeles, Cal.; Leonard A. Seltzer, of Detroit, Mich.

For Members of the Council for Three Years—Jas. H. Beal, of Scio, O.; Edw. Kremers, of Madison, Wis.; Jos. L. Lemberger, of Lebanon, Pa.; Wm. Mittelbach, of Boonville, Mo.; Geo. F. Payne, of Atlanta, Ga.; J. P. Remington, of Philadelphia, Pa.; Henry H. Rusby, of Newark, N. J.; Lucius E. Sayre, of Lawrence, Kan.; M. I. Wilbert, of Washington, D. C.

CHAS. M. FORD, *Secretary.*

The Chair called for the reading of the minutes of the Council as the next order of business, and Secretary Joseph W. England read the minutes of the second session, held August 16, 1909, as follows:

MINUTES OF THE COUNCIL OF A. PH. A.

The second session of the Council for 1908–1909 was held at Hotel Alexandria, Los Angeles, Cal., on August 16, 1909, Chairman J. P. Remington presiding. The meeting was called to order at 9:30 A. M. The following were noted as being present: Messrs. Asher, Beal, Bond, Caspari, Claus, Eberle, England, Ford, Godbold, Hallberg, Koch, La Pierre, Mason, Meissner, Remington, Searby, Seltzer, Whelpley and Wilbert. 19 present.

The reading of the minutes of the previous session was omitted, as they had already been published in the Proceedings.

Secretary England presented the following synopsis of the business transacted by the Council since the first session held at Hot Springs, Ark., September 12, 1908.

Council Letter No. 2—Philadelphia, October 15, 1908.

Communication from Charles F. Mann, Chairman of the Executive Committee of the N. A. R. D., with reference to the time and place of the next meeting of the A. Ph. A., presented.

Communications received, also, from ex-President Wm. M. Searby, and from a Committee of Druggists of Los Angeles, Cal., composed of Geo. H. McLain, President, H. L. Park, Vice-President, and T. W. Jones, Secretary, most strongly urging the selection of Los Angeles, Cal., as the meeting place of the A. Ph. A. for 1909.

Council Letter No. 3—Philadelphia, October 15, 1908.

On the Transfer of the Books and Accounts of Treasurer—The Chairman of the Council received from James H. Beal, former Chairman, the cash book of the Council and four bank books, the accounts being in the Boston Penny Savings Bank of Boston, Mass. Status of the accounts as follows:

a. Ebert Fund. Balance April 8, 1908	$941	96
b. Life Membership Fund. Balance April 30, 1908	3,034	55
c. Centennial Fund. Balance April 8, 1908	1,248	65
d. Endowment Fund. Balance September 27, 1908	2,475	31

In correspondence with Treasurer Whelpley it was deemed best to open an account with the International Bank of St. Louis, Mo. This bank was reported upon by Theodore F. Meyer and Charles W. Wall (of the Meyer Bros. Drug Co.), who stated that the bank is as safe as any in St. Louis.

A report was received from the committee appointed to supervise the transfer of the books and accounts of former Treasurer S. A. D. Sheppard, of Boston, Mass., to Treasurer-elect Henry M. Whelpley, of St. Louis, Mo., stating that the transfer has been made.

The committee consisted of John G. Godding and Linville H. Smith, of Boston.

Treasurer Whelpley reported the receipt of a check for $14,080.60 from former Treasurer S. A. D. Sheppard.

Council Letter No. 4—Philadelphia, October 15, 1908.

On the Committees of the Council for 1908–09—The By-Laws of the Council require that the following committees shall be elected by ballot:

1. Committee on Membership, consisting of seven members of the Council, with the General Secretary and the Treasurer *ex-officio* members.

2. Committee on Publication, consisting of five members of the Council.

According to Chapter 9, Article 2, of the By-Laws of the Council, the Chairman of the Council or the Chairman of a committee may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question.

For the Committee of Membership and Committee on Publication, the Chairman of the Committee in each case is elected by the committee itself.

The Committee of Finance does not elect its Chairman, and the Committee on Centennial Fund must, according to the By-Laws, consist of the President (or one of the Vice-Presidents), the Chairman of Committee on Finance and the General Secretary.

The Auditing Committee is appointed by the Chairman of the Council, and will be announced later.

Nominations for these committees were offered for amendment and final vote by the members.

Council Letter No. 5—Philadelphia, October 21, 1908.

Motion No. 5 (Gold Badges)—That the General Secretary be instructed to order forty of the official gold badges.

Motion No. 6 (Copies of Bulletin of Comments upon the U. S. Pharmacopœia for Members of the American Pharmaceutical Association)—That Surgeon-General Wyman, of the United States Public Health and Marine Hospital Service, be requested by the Council to send copies of the proposed Bulletin of Comments upon the United States Pharmacopœia, etc., to the members of the American Pharmaceutical Association, provided the rules of the service will permit of such distribution of bulletins.

The following motion was offered at the general session of the Association held September 12, 1908, and as it involved the expenditure of money, was referred to the Council for action:

"That the A. Ph. A. issue a small pamphlet explaining the metric system and its advantages, and distribute these pamphlets among the students of the medical colleges (for the students are the people we must reach), thereby giving the young physician the guide to his calculations."

Motion No. 3 (Election of New Member No. 1)—Applicant for membership No. 1 elected.

Council Letter No. 6—Philadelphia, October 26, 1908.

Permission asked by Lea and Febiger of Philadelphia to use for comment parts of the

text of the National Formulary in a new edition of the National Standard Dispensatory, as per specimen of formula in abstract submitted, as indicated.

Motion No. 4 (Pamphlet on Metric System for Medical Students)—That the resolution offered at the general session of the Association held September 12, 1908, and referred to the Council for action (See Council Letter No. 4) be laid upon the table.

The Finance Committee approved the selection of the International Bank of St. Louis as the place of deposit of the current funds in the hands of the treasurer.

The following question was submitted to the Council: "Do you approve of the report of the Finance Committee and the Treasurer in selecting the International Bank of St. Louis as the depository of the current funds of the A. Ph. A."

Motion No. 5 (Election of New Members)—Applicants for membership Nos. 5 to 7 elected.

The application of new members Nos. 2, 3 and 4 have been held over for action for the present.

Motions Nos. 5, 6, and 7 (See Council Letter No. 4) have carried, a majority voting for the same.

Council Letter No. 7—Philadelphia, October 27, 1908.

Letter from W. M. Searby was presented, moving that the Council accept on behalf of the American Pharmaceutical Association the invitation of the druggists and citizens of Los Angeles, to meet in that city in 1909.

Motion No. 6—Do you approve of a vote being taken now to determine the wishes of a majority of the Council on Prof. Searby's motion.

Letter on the same subject presented by F. C. Godbold, also a majority of the voting sheets for nominations for the Committee on Membership and the Committee on Publication (see Council Letter No. 3) were returned to the Secretary, and the list as nominated was:

Committee on Membership—William Mittelbach, Eugene G. Eberle, George H. Hitchcock, Carl S. N. Hallberg, Joseph L. Lemberger, Leonard A. Seltzer, Frederick W. Meissner, Jr.

Committee on Publication—Charles Caspari, Jr., C. Lewis Diehl, Martin I. Wilbert, Charles E. Vanderkleed, James H. Beal.

A communication was received from James H. Beal, positively declining election as a member of the Committee on Publication.

Motion No. 7 (Member of Committee on Publication)—Moved that C. S. N. Hallberg be named for the Committee on Publication, vice James H. Beal, resigned.

Motion No. 8 (Election of Committee on Membership and Publication)—Do you vote for the Committee on Membership and Committee on Publication as nominated?

Council Letter No. 8—Philadelphia, October 30, 1908.

Motion No. 9 (Approval of Selection of the International Bank of St. Louis, as a Depository of the A. Ph. A.)—Do you approve of the report of the Finance Committee and the Treasurer in selecting the International Bank of St. Louis as the depository of the current funds of the A. Ph. A.?

Motion No. 10 (Permission to Use Parts of National Formulary in the National Standard Dispensary)—That permission be granted Messrs. Lea & Febiger of Philadelphia, Pa, to use the text of the National Formulary in abstract form in the National Dispensatory, as submitted in the applications (See Council Letter No. 6), such permission for similar form having already been granted to the American Medical Association, the United States Dispensatory, E. R. Squibb & Sons and others.

Motion No. 11 (Election of New Members)—Applicants for membership Nos. 2, 3, 4, 8, 9 elected.

Motions 8 and 9 have carried.

The Committee on Standards for Non-official Drugs and Chemical Products, as finally constituted is:

Manufacturing Chemists—George D. Rosengarten, Thomas P. Cook.

Manufacturing Pharmacists—John M. Francis, C. E. Vanderkleed.

Wholesale Druggists—George B. Kauffman, M. N. Kline.

Retail Druggists—H. P. Hynson, Geo. M. Beringer, O. Raubenheimer, J. M. Good, Leo Eliel.

Pharmaceutical Faculties—Richard Fisher, Chas E. Caspari, W. A. Puckner, J. A. Koch.

Council Letter No. 9—Philadelphia, November 3, 1908.

A letter was received from H. P. Hynson upon the subject of a combination meeting of the A. Ph. A. and N. A. R. D., and the following motion was presented.

Resolved, That it is the sense of the Council that the meeting of this Association, in 1909, should be held in as close connection with the meeting of the National Association of Retail Druggists as can be arranged for, and that a Committee of three should be appointed by the Chairman of the Council to confer with the Executive Committee of the N. A. R. D., with power to arrange details.

The above motion was regarded as

Motion No. 16 (*On Time and Place of Meeting for 1900*)—Communications were received, also, upon time and place of meeting from the California State Board of Pharmacy and the Seattle Retail Druggists Association.

Motion No. 17 (*Election of New Members*)—Applicants for membership Nos. 9 and 10 elected.

Council Letter No. 10—Philadelphia, November 11, 1908.

Motion No. 18 (*Additional Appropriation for Miscellaneous Expenses*)—That an additional sum of $100 be appropriated for the account of miscellaneous expenses.

H. M. Whelpley sent a communication upon the subject of a joint meeting of the A. Ph. A. and N. A. R. D.

Council Letter No. 11—Philadelphia, Pa., December 5, 1908.

Committee on Publication voted for Charles Caspari, Jr., as Chairman. The other members of the Committee were elected, Messrs. Hallberg, Diehl, Wilbert and Vanderkleed.

Committee on Transportation—The following were enumerated: Chas. Caspari, Jr. (Chairman), Baltimore, Md.; C. S. N. Hallberg, Chicago, Ill.; Caswell A. Mayo, New York, N. Y.; Chas. M. Ford, Denver, Col.; Chas. G. Merrell, Cincinnati, O.; J. G. Godding, Boston, Mass.; W. S. Elkin, Jr., Atlanta, Ga.; H. M. Whelpley, St. Louis, Mo.; Wm. M. Searby, San Francisco, Cal.; F. J. Wulling, Minneapolis, Minn.; Philip Asher, New Orleans, La.

Motion No. 19 (*Frontispiece for 1908 Volume of Proceedings*)—That a picture of the late Henry Martin Whitney, ex-President of the A. Ph. A., be published as a frontispiece to the 1908 volume of proceedings.

The letter received announcing the organization of the City of Washington Branch of American Pharmaceutical Association, on November 18, 1908.

Motion No. 20 (*Election of New Members*)—Applicants for membership Nos. 11–26 elected.

Council Letter No. 12—Philadelphia, Pa., December 16, 1908.

On Time and Place of Next Meeting—Letters presented from President Oldberg of the A. Ph. A., and W. S. Elkin, Jr., President of the N. A. R. D., and T. H. Potts, Secretary of the N. A. R. D.

Expression of opinions from the members or the Council were received also, from the following: Charles E. Vanderkleed, Charles E. Dohme, M. I. Wilbert, Otto F. Claus, C. Lewis Diehl, F. C. Godbold, Frederick J. Wulling, Jos. L. Lemberger, Wm. M. Searby.

Motion No. 21 of $12.50 Appropriation for Premium on Treasurer's Bond.

Motion No. 22 (Committee on National Formulary)—That the Committee on National Formulary be composed of C. Lewis Diehl, Louisville, Ky.; C. S. N. Hallberg, Chicago, Ill.; H. P. Hynson, Baltimore, Md.; A. B. Stevens, Ann Arbor, Mich.; Chas. H. LaWall, Philadelphia, Pa.; Henry V. Arny, Cleveland, Ohio; George M. Beringer, Camden, N. J.; E. Fullerton Cook, Philadelphia, Pa.; H. A. Brown Dunning, Baltimore, Md.; Leo Ehel, South Bend, Ind.; Joseph W. England, Philadelphia, Pa.; William A. Hall, Detroit, Mich.; Wilbur L. Scoville, Detroit, Mich.; Leonard A. Seltzer, Detroit, Mich.; M. I. Wilbert, Washington, D. C.

Motion No. 23 (Election of New Members)—Applicants for membership from Nos. 27–29 elected.

Council letter No. 13—Philadelphia, January 12, 1909.

Communication received from City of Washington Branch A. Ph. A. relative to joint meeting of the A. Ph. A. and the N. A. R. D. in 1909.

Motion No. 24 (On Place of Next Meeting)—Moved by M. G. Motter, seconded by M. I. Wilbert, that the fifty-seventh annual meeting of the A. Ph. A. be held at Niagara Falls, N. Y., and that the Committee on Conference be instructed to request that the N. A. R. D. meet at the same place on a date to be mutually agreed upon.

A letter on time and place of next meeting was presented by Wm. M. Searby, urging definite action.

President Oscar Oldberg addressed the Council on the subject of the blank used for application for membership in the American Pharmaceutical Association, and moved that a new blank proposed be adopted in place of the old one.

The above motion was considered as *Motion No. 25 (Adoption of New Blank for "Application for Membership")*.

Separate enclosures were sent so that the new form may be compared with the old form.

A letter was received from C. H. Hitchcock protesting against the make-up of the proposed Committee on National Formulary, not from what has been done, but from what has *not* been done, in that New York was not represented on the committee.

To meet Mr. Hitchcock's objections, and in view of the fact that the duties of the Secretary of the Council were requiring more and more work, J. W. England resigned as a member of the Committee on National Formulary, provided that his place was filled by a New York representative.

The following names were nominated for the *Auditing Committee:* Otto F. Claus, Chairman, St. Louis, Mo.; Wm. Mittelbach, Boonville, Mo.; Thomas Knoebel, East St. Louis, Mo.

Of the *Committee on Standards for Non-official Drugs and Chemical Products*, named at the Hot Springs meeting, Edward Mallinckrodt declined service, and with the consent of the Council, the Chairman named George D. Rosengarten in place of Mr. Mallinckrodt.

With regard to the *Chairmen of the Committee on Standards of Non-official Drugs and Chemical Products*, a request was sent to each member of the committee to express his preference for Chairman; the last vote stands as follows: George M. Beringer, 6 votes; C. E. Caspari, 4; G. D. Rosengarten, 3; two members not voting.

The Chairman of this Committee, according to the resolution creating the committee, must be elected by the Council. The committee is as follows:

Manufacturing Chemists—George D. Rosengarten, Thomas P. Cook.

Manufacturing Pharmacists—John M. Francis, C. E. Vanderkleed.

Wholesale Druggists—George B. Kauffman, M. N. Kline.

Retail Druggists—H. P. Hynson, Geo. M. Beringer, O. Raubenheimer, J. M. Good, Leo Eliel.

Pharmaceutical Faculties—Richard Fischer, Chas. E. Caspari, W. A. Puckner, J. A. Koch.

Motion No. 26 (*Authorized Agents*)—That the system of authorized agents be discontinued (see A. Ph. A. Proceedings for 1907, page xiv).

With reference to the *Committee on Transportation* nominated (see Council Letter No. 11), there were no additional nominations, except that of Caswell A. Mayo as Chairman. The list of nominees as finally presented was: Chas. Caspari, Jr., Chairman, Baltimore, Md.; Caswell A. Mayo, Chairman, New York City; Chas. G. Merrell, Cincinnati, Ohio; W. S. Elkin, Jr., Atlanta, Ga.; Wm. M. Searby, San Francisco, Cal.; Philip Asher, New Orleans, La.; C. S. N. Hallberg, Chicago, Ill.; Chas. M. Ford, Denver, Colo.; J. G. Godding, Boston, Mass.; H. M. Whelpley, St. Louis, Mo.; F. J. Wulling, Minneapolis, Minn.

Motion No. 27 (*Election of Members of Committee on Transportation*)—Vote on above nominees and for chairman.

Motion No. 28 (*Election of New Members*)—Applicants for membership Nos. 30–33.

Committee on Membership—The Chairman is elected by the Committee. On the first vote no majority was had for any member; and on the second vote a majority was had for Wm. Mittelbach, all the members voting. The vote was: Wm. Mittelbach, 4 votes; C. S. N. Hallberg, 2; and J. L. Lemberger, 1. Mr. Mittelbach is therefore elected Chairman of this committee.

Strike out the name of J. H. Beal in the list of members of Committee on Publication, as stated in Council Letter No. 11 (p. 19). It will be recalled that Mr. Beal resigned from the Committee on Publication (see Council Letter No 7), and that C. S. N. Hallberg was nominated (Motion No. 11) to succeed him, and later elected.

Motions Nos. 21, 22 and 23 (*Council Letter No. 12*) have carried.

Council Letter No. 14—Philadelphia, Pa., January 29, 1909.

Statement of Chairman Remington that the time has arrived for a decisive vote on the subject of time and place for the next meeting of the American Pharmaceutical Association. The motion to meet at Niagara Falls (Motion No. 24) failed to pass by the following vote: Ayes, 8; nays, 10; not voting, 12.

Motion No. 29—That the Council accept on behalf of the American Pharmaceutical Association the invitation of the druggists and citizens of Los Angeles to meet in that city in 1909.

Council Letter No. 15—Philadelphia, Pa., February 6, 1909.

The question of the place for the next annual meeting of the A. Ph. A. settled in favor of Los Angeles, Cal. The motion on place of meeting (Motion No. 29) resulted as follows:

In favor of Los Angeles—Bond, Claus, Dohme, Eberle, Eliel, England, Godbold, Hallberg, LaPierre, Lemberger, Mittelbach, Oldberg, Searby, Vanderkleed, Whelpley, Wulling—16 in number.

Against Los Angeles—Beal, Culbreth, Day, Diehl, Hynson, Seltzer, Wilbert, Motter—8 in number.

Not Voting—Caspari, Hitchcock, Mason, Meissner, Remington, Sheppard—6 in number.

The following report of the Committee on Relations of the A. Ph. A. to the N. A. R. D. was submitted:

To the Council of the American Pharmaceutical Association:

The committee appointed to confer with a like committee of the N. A. R. D. relative to future joint or successive meetings of the A. Ph. A. and N. A. R. D. respectfully reports as follows:

WHEREAS, The Executive Committee of the N. A. R. D. has reported the adoption by that committee of the following preamble and resolutions:

"WHEREAS, The committee appointed by the President of our Association to confer with a similar committee from the American Pharmaceutical Association, to consider the feasibility of holding a joint meeting or contemporaneous meetings of the two Associations, has been unable to reach such a conclusion with that committee as would enable it to recommend to the N. A. R. D. a definite time and place for holding its 1909 convention.

WHEREAS, It has always been the custom of this committee to name at its mid-year meeting the time and place for holding the annual convention of the N. A. R. D., and our members are expecting the usual announcement at the close of the present meeting of this committee; therefore, by the Executive Committee of the N. A. R. D. be it

Resolved, That we hereby select Louisville, Ky., as the place, and Monday, Tuesday, Wednesday and Thursday, September 6, 7, 8 and 9, as the time for holding the 1909 convention of this organization.

Resolved, That, desirous as we are of coöperating in every helpful way possible with the American Pharmaceutical Association, in the efforts which that organization and our own are making to advance the professional and commercial welfare of pharmacy, we hereby extend to the A. Ph. A. a hearty invitation to meet with us at the place and, as may be feasible, at the time designated."

Therefore this committee recommends to the Council the adoption of the following resolutions:

(1) That the Council cordially reaffirms the sentiment expressed in the resolution adopted at the Hot Springs meeting, relative to coöperation between the American Pharmaceutical Association and the National Association of Retail Druggists.

(2) That in the opinion of the Council cordial relations between the two Associations will be promoted by occasional closely succeeding meetings held at the same place.

(3) That the President of the N. A. R. D. and the President ot the A. Ph. A. be requested to jointly select a joint committee of five to consist of persons who are members of both Associations, said joint committee to consider the selection of a time and meeting place for the two Associations in 1910, and to report at the respective conventions of 1909, or as soon thereafter as practicable.

(4) That the present A. Ph. A. committee be relieved of further consideration of the subject.

Sincerely yours.

H. M. WHELPLEY,
J. H. BEAL.

Motion No. 30 (Adoption of Committee Report)—Moved and seconded that the report submitted by the Committee on Relations of the A. Ph. A. to the N. A. R. D. be adopted.

Carried.

Mr. Hallberg moved: "If Motion No. 29 carries I move that the time of meeting be from August 16 to 20, 1909."

Mr. Searby moved providing that we meet at Los Angeles, "that the time be fixed for August 23–28, 1909."

Council Letter No. 16—Philadelphia, February 13, 1909.

Statement from J. W. England on his resignation as a member of the N. F. Committee.

Motion No. 33 (Vacancy in N. F. Committee)—Moved by Charles Caspari, Jr., seconded by J. W. England, that the resignation of J. W. England as a member of the

Committee on National Formulary be accepted, and that Otto Raubenheimer be elected to fill the vacancy.

Prof. Diehl presented a letter on this question.

A letter from Leonard A. Seltzer on this subject also was presented.

Motion No. 34—Resignation of Leonard A. Seltzer as a member of the N. F. Committee.

Motion No. 35—That the sum of fifty dollars be appropriated to meet the office and miscellaneous expenses of the President, or so much of that sum as may be necessary.

Motion No. 36—That the names selected by the Chairman (see Council Letter No. 13, p. —), viz.: Otto F. Claus, Chairman, St. Louis, Mo.; Wm. Mittelbach, Boonville, Mo.; Thomas Knoebel, E. St. Louis, Ill., be chosen by the Council as the Auditing Committee.

Motion No. 37—The nominees for the Committee on Transportation (see Council Letter No. 13, p. —) have all been elected. The vote for Chairman was: Caswell A. Mayo, 17; Charles Caspari, Jr., 3; H. M. Whelpley, 1; not voting, 9. Mr. Mayo is therefore Chairman of the Committee.

Motion No. 38 (Chairman of Committee on Standards of Non-official Drugs and Chemical Products)—George M. Beringer and W. A. Puckner were nominated.

Motion No. 39—That the equirement in blank for application for membership reading, "If local bank check is sent make it $5.10 to cover exchange," be eliminated.

Motion No. 40—That George Gundrum, of Ionia, Mich., who joined the A. Ph. A. in 1882, and has paid his 1909 dues, be made a life member, old style.

Motion No. 41—Applicants for membership Nos. 34–62 elected.

Motions Nos. 25, 26, 27, 28 (See Council Letter No. 13) carried.

In Council Letter No. 15 (p. —), on "The Time for Holding the Next Annual Meeting," mark Mr. Hallberg's motion as No. 31 and Mr. Searby's motion as No. 32.

Council Letter No. 17—Philadelphia, February 18, 1909.

Thomas William Jones, of Los Angeles, nominated (Motion No. 42) for Local Secretary.

The votes on Time of Next Meeting are coming in very slowly.

A communication received from B. E. Pritchard, Secretary, advising the Council that the Pittsburg Branch of the A. Ph. A. was organized on January 28, 1909, with a membership of about thirty; that Dr. Julius A. Koch was elected Chairman, and member of the Council to represent the Branch, and that B. E. Pritchard was made Secretary.

Council Letter No. 18—Philadelphia, Feb. 26, 1909.

Motion No. 30 (Adoption of Report of Conference Committee)—Carried. Votes: Yes 18, No. 1, Not voting 11.

Motion No. 31, on "Time for Holding the Next Annual Meeting," providing that the time be fixed for August 16–20, 1909—Adopted. Votes: Yes 17, No. 2, not voting 11.

Motion No. 32 (Providing that the time be fixed for August 23–28, 1909)—Lost. Votes: Yes 6, No. 0, not voting 24.

Motion No. 33 (Accepting the resignation of J. W. England as a member of the Committee on National Formulary, and appointing Otto W. Raubenheimer to succeed him)—Passed by the following votes: Yes 17, No. 3, not voting 10.

Motion No. 34 (Resignation of L. A. Seltzer as a member of the N. F. Committee)—Not accepted. Votes: Yes 4, No. 17, not voting 9.

Motion Nos. 35, 36 and 37 (See Council Letter No. 66, p. 36)—All carried.

Motion No. 38 (Chairman of Committee on Standards of Non-Official Drugs and Chemical Products)—Carried. Votes for Chairman: George M. Beringer, 16; W. A. Puckner, 7; not voting, 7. Mr. Beringer is therefore Chairman.

Motions No. 39, 40, 41 (See Council Letter No. 16, p. 37) and Motion No. 42 (See Council Letter No. 17, p. 39)—All carried.

Motion No. 43—That the Treasurer be directed to invest $5,000 of the current funds of the Association in safe security—the Chairman of the Council, with the Finance Committee, to advise with the Treasurer on selection of said security.

Motion No. 44—That Frank C. Simson, of Halifax, N. S., who joined the A. Ph. A. in 1876 and has now practically retired from active work and business, be made a life member, old style, without receiving the proceedings.

Motion No. 45—That an additional sum of $150.00 be appropriated for miscellaneous expenses.

Treasurer Whelpley reports that B. T. Fairchild, Treasurer of the Procter Memorial Committee, in accordance with the action of the Association at the 1907 meeting (See page 99 of the volume for that year), has turned over the funds on hand. The Treasurer has, on recommendation of the Chairman of the Finance Committee, deposited the money ($3,413.33) in the International Bank of St. Louis for a period of twelve months. The interest for that time will amount to $136.53.

Motion No. 46—Do you approve the action of the Treasurer in depositing the sum of $3,413.33 belonging to the Procter Memorial Fund in the International Bank of St. Louis for one year where it will earn interest amounting to $136.53?

Motion No. 47—That the Committee on Publication be instructed to have 1,000 reprints struck off of the Report of the Committee on National and State Legislation, and that these reprints be placed at the disposal of the General Committee on Membership for judicious distribution among prospective applicants for membership.

On motion by J. H. Beal, seconded by J. L. Lemberger, the Committee on Publication was instructed to have a suitable number of reprints made of the Report of the Committee on National and State Legislation, and judiciously distribute them.

Motion No. 48—Applicants for membership. Nos. 63–72 elected.

Council Letter, No. 19—Philadelphia, March 27, 1909.

Motion No. 49—That the awarding of Certificates of Membership in the A. Ph. A. as Prizes be abolished.

Resolution offered by H. P. Hynson:

Resolved, That the Council offer to schools of pharmacy and boards of pharmacy for prizes a copy of the Proceedings of the Association, together with a copy of the General Index, at the special price of $5.00 for both, with the understanding that a copy of the Proceedings shall be one of any issue of which the Association has a surplus, preference, of course, being always given those of later years, it being understood that circular matter soliciting the membership of the recipient shall be enclosed with the books.

Motion No. 50—That General Secretary Caspari be authorized to obtain such legal advice and assistance as may be necessary to properly discharge the business assigned to him in connection with the charter of the A. Ph. A.

Motion No. 51—That the Local Secretary Thomas William Jones, of Los Angeles, Cal, be appointed chairman of the Committee on Arrangements for the 1909 meeting, with authority to select his associates on the Committee.

Motion No. 52—That the American Pharmaceutical Association annually refund to each local branch one dollar of the five dollars paid by each member of the local branch for annual dues to the American Pharmaceutical Association.

Motion No. 53—Applicants Nos. 73–105 elected.

Motions Nos. 43, 44, 45, 46, 47 and 48 (see Council Letter No. 18), have all carried.

Council Letter No. 20—Philadelphia, April 17, 1909.

Motions Nos. 49, 50, 51 and 53 (*Council Letter No. 19*) all carried; No. 52 pending.

Substitute for Motion No. 52, offered in Council Letter No. 19—"Moved that a rebate of ten per cent. be allowed to each local branch of the A. Ph. A. on annual dues collected from its members and transmitted to the treasurer of the A. Ph. A."

Motion No. 52, as amended by Messrs. Whelpley and Vanderkleed, presented. It read: "That the A. Ph. A. annually refund to '*the treasurer of*' each local branch one dollar of the five dollars paid by each member of the local branch for annual dues to the A. Ph. A." (and with the addition of J. H. Beal's amendment, would provide further), "*when the dues of such members are paid through the local branch of which they are members.*

Letter presented from Edward Kremers, Historian of the Committee on Historical Pharmacy, asking that the Council secure, if possible, proper exchanges from those associations and libraries to which we send our proceedings, and suggesting the consideration of the advisability of discontinuing the sending of our proceedings to such organizations and bodies that do not send a fair equivalent.

Letter received from Wm. B. Day, Chairman of the Membership Committee, on work of committee.

Motion No 54—That the sum of $100 be appropriated for the Membership Committee to cover deficit to June 1, 1909.

Motion No. 55—That an additional sum of $100 be appropriated for printing and stationery, in order that this item may be provided for to the end of the present fiscal year.

Motion No. 56—That the General Seeretary be authorized to have 40 gold bars made for the fifty-seventh annual meeting to be held at Los Angeles in August, 1909.

Motion No. 57—Applicants for membership, Nos. 106–132, elected.

Council Letter No. 21—Philadelphia, May 14, 1909.

Motions Nos. 54, 55, 56 and 57—All carried; No. 52 still pending.

Communication received from Secretary Ambrose Hunsberger of the Philadelphia Branch of the A. Ph. A. (April 24, 1909), stating that:

"At the annual election of the Philadelphia Branch of the A. Ph. A. held in March, Ambrose Hunsberger was elected as member of Council of the American Pharmaceutical Association from the Philadelphia Branch, the term of service beginning at the expiration of Mr. Wilbert's term (which occurs during the 1909 Convention of the American Pharmaceutical Association), and ending with the 1912 Convention of the same body."

Secretary F. W. Nitardy of the Denver Branch of the A. Ph. A. wrote (April 15, 1909), that: "The Denver Branch of the A. Ph. A. was organized January 28, 1909. At our March meeting A. W. Clark was elected a member of the Council."

Secretary H. V. Arny of the Northern Ohio Branch of the A. Ph. A. wrote (April 28, 1909), that: "At a meeting of the Northern Ohio Branch of the A. Ph. A., held March 19, 1909, Lewis C. Hopp was elected a member of the Council to represent our Branch."

Motion No. 58—That Chairmen of Sections be requested to complete the programs of their respective Sections and to secure abstracts of such papers and to send them to the Editor of the Bulletin not later than July 10th, so that the August Bulletin may appear promptly August 1st as a complete program of the meeting.

Motion No. 59—Applicants for membership from Nos. 123–151 elected.

Motion No. 60—That Morris A. Posen of 1410 Eye St., N. W., Washington, D. C., be accepted as a certificate prize member, nominated by the District of Columbia Board of Pharmacy, 1909.

Council Letter No. 22—Philadelphia, May 20, 1909.

James H. Beal appointed as a member to especially aid the Committee on Transportation. (Motion No. 61.)

Membership Committee submitted report supplementary to April 1, 1909.

Motion No. 62—That $100 be appropriated for the use of the Membership Committee during June and July, and that prompt action be taken, so that the work may continue without interruption, June 1st.

Motion No. 63—Applicants Nos. 152–164 elected.

Council Letter No. 23—Philadelphia, June 3d, 1909.

Motions Nos. 61, 62 and 63 of Council Letter No. 22 carried.

The General Secretary, the Local Secretary and the Secretary of the Council submitted the program, which, after some minor changes, was approved.

Motion No. 64—An additional appropriation of $75, or as much as may be necessary for printing and stationery, was ordered.

Motion No. 65—Applicants for membership from Nos. 165–189 elected.

Council Letter No. 24—Philadelphia, July 14, 1909.

Motions Nos. 64, 65 and 66 of Council Letter No. 23 carried.

Motion No. 66—Appropriating $100 to Committee on Standards for Non-official Drugs and Chemical Products, to defray the expenses of the clerical work for the present year, carried.

Motion No. 67—That the second session of the Section on Commercial Interests be held on Tuesday evening at 8 o'clock instead of Wednesday afternoon at 3 o'clock so that the two sessions of the Commercial Section may follow one another on the same day and in the same room, thus avoiding a repetition of the unfortunate condition of things which practically killed the second session of the Section last year at Hot Springs.

Proposed Receipt Book—Communication received from H. P. Hynson on the propriety of the American Pharmaceutical Association publishing a general druggist's receipt book, for consideration and discussion at Los Angeles.

New Orleans Branch—A. J. Guidry, Secretary, reported that Philip Asher was elected Member of the Council from that Branch.

Branch–Rebating—Proposed for Discussion—Charles Caspari, Jr., wrote that, in view of the apparent opposition to Motion No. 52, that one-fifth of the annual dues be credited to the respective Branches, he preferred to withdraw his substitute to said motion, and in its stead to urge that the whole matter be laid on the table, for further discussion at Los Angeles.

Motion No. 68—That William Gordon Palmer be elected as a certificate prize member New Mexico Board of Pharmacy, without a certificate.

Motion No. 69 (Certificate Prize, Florida Board of Pharmacy)—Simon H. H. Cameron, Jacksonville, Fla. Application similar to the above and ordered to take the same course as the preceding one.

Motion No. 70—(Election of New Members)—Applicants for membership, Nos. 190–283, elected.

A synopsis of the annual report of the Treasurer was presented by Mr. Whelpley, also a special report on the payment of salaries, as follows:

SPECIAL REPORT OF THE TREASURER ON THE PAYMENT OF SALARIES.

The Association fiscal year begins July 1, and closes June 30. The salaries however have been paid from September 1 to March 1, and March to September 1. Ex-Treasurer S. A. D. Sheppard in a letter to me dated December 17, 1908, makes this statement:

"It can be easily verified by examination of various reports of the Treasurer, printed in the Proceedings."

I have examined the records and find that the first annual report submitted by Treasurer S. A. D. Sheppard, gives a clear statement of the matter (see Proc., Vol. 35, page 457). It says that the salaries of the Treasurer, General Secretary, Secretary of the Council and reporter on Progress of Pharmacy, each cover the year "September to September."

The records show that this practice has been continued with the General Secretary and the Reporter on Progress of Pharmacy who have been paid to September 1, 1909. The recently elected Secretary of the Council has been paid to July 1, 1909, and the same is true of the present Treasurer.

I move that the salary year be made the same as the fiscal year, *i. e.*, July 1 to June 30 inclusive. HENRY M. WHELPLEY, *Treasurer.*

St. Louis, August 1, 1909.

The motion to change the time of paying the salaries of officials so that they shall all be paid at the end of the fiscal year (July 1), proposed by Treasurer Whelply, was adopted.

The Finance Committee presented the budget for the year through Otto F. Claus as follows:

PROPOSED BUDGET OF APPROPRIATIONS FOR 1909-1910.

Salaries	$2800 00
Proceedings	3750 00
Printing and Stationery	500 00
Miscellaneous Expenses	300 00
Stenographers	325 00
Badges and Bars	90 00
Journals for Reporters	35 00
Committee on Membership	50 00
Traveling Expenses	375 00
Premium on Treasurer's Bond	12 50
Insurance	50 00
Certificates	15 00
Section on Scientific Papers	25 00
Section on Education and Legislation	25 00
Section on Commercial Interests	25 00
Section on Practical Pharmacy	25 00
Section on Historical Pharmacy	50 00
A. Ph. A. Bulletin	1500 00
	$9952 50

It was decided to postpone action on the budget for the present.

It was agreed that a special committee of three be appointed to consider the question of the expenses of the Committee on Membership.

The Committee on Credentials was appointed by the Chair, consisting now of Messrs. Seltzer, Wilbert and Godbold.

A communication from J. H. Beal was read recommending that the Association should have a traveling representative for the purpose of increasing the general interest and adding members to the Association, and offering to pay the expenses incurred by such a representative over and above the fees collected for a period of two months. The proposition, which was as follows, was accepted:

LOS ANGELES, CAL., *August 16, 1909.*

Council of the American Pharmaceutical Association,

Gentlemen: It seems highly important to the writer that the Association should have a traveling representative to visit the leading cities of the United States in the interests of the American Pharmaceutical Association both for the purpose of increasing the general interests of the drug trade in our Association, and adding to the membership list.

In case the Association will employ a suitable representative for that purpose for a period of two months, to visit one or more of the leading cities, and in case the fees for new members secured by such representative shall not be sufficient to pay his salary and

traveling expenses, the writer will upon notification pay to the treasurer of the Association an amount equal to such difference.

Respectfully yours, J. H. BEAL.

Chairman Remington presented the following Report on Savings Accounts and Bonds:

REPORT OF THE COUNCIL CHAIRMAN ON SAVINGS ACCOUNTS AND BONDS JULY 1, 1909.

Ebert Fund.

Deposited with the Boston Penny Savings Bank		$979 38

Centennial Fund.

Deposited with the Boston Penny Savings Bank	$1,329 67	
Massachusetts State Bond No. 1705	1,000 00	
		2,329 67

Life Membership Fund.

Deposited with the Boston Penny Savings Bank	$3,604 90	
Massachusetts State Bonds Nos. 1701, 1702, 1703 and 1704	13,000 00	
		16,604 90

Endowment Fund.

Deposited with the Boston Penny Savings Bank		3608 35
Total Savings and Invested Funds		$23,522 30

The undersigned being first duly sworn depose and say that the above is a true statement of the savings accounts shown by the books of the Boston Penny Savings Bank, and of the bonds in the hands of Joseph P. Remington on July 1, 1909.

JOSEPH P. REMINGTON,
E. FULLERTON COOK.

Sworn before me this 22nd day of July, 1909.

[Seal.] J. M. ELLIOTT,
Mayor.

Massachusetts State 3 per cent. bonds:

No. 1701	$10,000
No. 1702	1,000
No. 1703	1,000
No. 1704	1,000
No. 1705	1,000
	$14,000

State of Pennsylvania,
County of Philadelphia } :

Personally appeared before me, a notary public in and for said County and State, the undersigned, Joseph P. Remington and Charles H. LaWall, who, being first duly sworn, depose and say that the above is a true statement of the bonds of the American Pharmaceutical Association in the hands of the said Joseph P. Remington, all of which have by them been examined and checked by them this ninth day of July, 1909.

Sworn to before me and subscribed to in my presence this ninth day of July, 1909.

JOSEPH P. REMINGTON,
CHARLES H. LAWALL.

A. E. MAHAN, *Notary Public.*

The report of the Secretary of the Council was presented and accepted. It was as follows:

REPORT OF THE SECRETARY OF THE COUNCIL.

To the Chairman and Members of the Council:

The Council of 1908–09 held one session in Hot Springs last year. The new Council has transacted business by mail since the Hot Springs meeting. The business has materially increased in volume.

The Council letters have increased in number from fifteen to twenty-four, covering sixty-three pages instead of thirty-five, and conveying seventy motions instead of thirty-nine.

Two hundred and eighty-three new members have been elected so far and no applicant rejected. For the year ending September 1, 1908, the applicants numbered 206.

A synopsis of the correspondence will be submitted to become a part of the published records. The minutes have been published in full in the "Bulletin" of the A. Ph. A.

The membership of the Council is rapidly increasing in numbers. Last year the number was 29, or with the Local Secretary 30; this year it is 35, or with the Local Secretary 36. The increase has come from the election of representatives from Local Branches in Pittsburg, Pa., Washington, D. C., Cleveland, O., New Orleans, La., and Denver, Colo.

Respectfully submitted, J. W. ENGLAND.

Philadelphia, July 23, 1909.

The report of the Committee on Publication was presented and accepted. It read:

REPORT OF THE COMMITTEE ON PUBLICATION.

Mr. Chairman and Members of the Council of the American Pharmaceutical Association:

Your Committee on Publication beg leave to report that the Proceedings of the fifty-sixth annual meeting have been published and a copy of the same delivered in March of the present year and since that time to every member entitled thereto, according to the Treasurer's accounts, besides the usual number (about 100) of complimentary copies to the honorary members, state libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Of the total number of books (2100) printed, 245 copies remain on hand in flat sheets, 1805 having been bound in cloth and 50 in paper. It was also found necessary during the past year to bind in cloth 25 copies of the 1906 volume and 235 copies of the 1907 volume of Proceedings, the stock having become exhausted and demand arising for the same. The cost of publication and delivery for the year 1908–1909 is shown by the following items:

Composition, paper and press work (2100 copies)						$2,557 72
Binding 1805 copies in cloth (1908) @ 23 cents					$415 15	
" 235 " " (1907) @ 23 cents					54 05	
" 25 " " (1906) @ 23 cents					5 75	
" 50 " paper (1908) @ 8 cents					4 00	
						484 95
Expressage and Postage						602 12
Illustrations						54 85
Journals for the Reporter (Foreign)						30 56
Canceled Matter						6 48
Reprints for Use of Authors						29 50
Resolutions and Notice of Meeting						3 21
Special Sets of Roll and List of Members						10 00
Salary of the Stenographer						200 00
Salary of the Reporter on the Progress of Pharmacy						750 00
						$4,729 39

Your Committee also desires to report that it became necessary during the past year to print another issue of 3,000 copies of the new edition of the National Formulary, making a total of 32,000 copies to date. The total expense thus far of publishing, advertising and delivering the third edition of the National Formulary amounts to $12,694.72. An account of the receipts from sales of the National Formulary will appear in the report of the General Secretary.

For the Committee, CHAS. CASPARI, JR.,

Baltimore, July 1, 1909. *Chairman.*

The Committee on Publication was instructed to print as a frontispiece for the 1909 volume of Proceedings a picture of the late William John Maclester Gordon. Mr. Gordon was a life member who joined in 1854. He was Recording Secretary from 1855 to 1859 and First Vice-President in 1860. He was elected President in 1864 and continued his interest in the A. Ph. A. as long as he lived.

General Secretary Caspari laid before the Council certain data bearing upon the payment of salary in October, 1908, to former Secretary of the Council, H. M. Whelpley, and stated that, inasmuch as he and the present Treasurer could not come to an agreement on the point at issue, it would be necessary for the Council to act in the matter.

On October 12, 1908, a bill from H. M. Whelpley for $62.50 for two and one-half months services (July 1 to September 15, 1908) as Secretary of the Council was approved and later on paid.

In December, 1908, attention was called by the late Treasurer, S. A. D. Sheppard, to the fact that the annual salary bills of the officers of the Association cover the period from September 1 of one year to September 1 of the following year, and in accordance with this statement, borne out by previous records in the Proceedings, the General Secretary decided that the bill above referred to had been paid in error and should have been rendered for $15.00 only, covering one half-month's service, September 1 to 15th, 1908, since the previous semi-annual salary bill paid the then Secretary of the Council had covered the period from March 1 to September 1, 1908.

In support of his contention the General Secretary submitted the following:

Up to and including the annual meeting of 1880 the business of the Association was handled by an Executive Committee, of which Geo. W. Kennedy was Chairman for a number of years.

At the second session of the annual meeting of 1880, on September 15, the by-laws were amended and the Council established. (Proc., 1880, p. 529).

The members of the first Council were nominated by the Nominating Committee (Proc., 1880, p. 571) and elected by the Association at large (Proc., 1880, p. 572), but no record appears in the 1880 Proceedings of the organization of the Council; the names of the officers of the first Council, however, appear on page 5 of the 1880 Proceedings, including that of Geo. W. Kennedy as Secretary.

On August 24, 1881, Geo. W. Kennedy was reelected Secretary of the Council, and again on September 14, 1882; also on September 13, 1883; August 23, 1884; September 10, 1885; September 8, 1886; September 9, 1887; September 5, 1888; June 28, 1889; September 11, 1890; April 30, 1891; July 18, 1892; August 19, 1893; September 5, 1894; August 16, 1895; August 14, 1896; August 28, 1897; September 2, 1898; September 6, 1899; May 9, 1900; September 20, 1901; September 13, 1902.

Up to the meeting of 1885 the Secretary of the Council received no salary, but at that meeting an annual salary of $50.00 was voted him, which was increased to $150.00 at the meeting of 1898. At the annual meeting of 1903 the secretary of the Council was permanently made Secretary of the Committee on Membership with an additional salary of $150.00 per annum, having previously held the office from year to year.

That the salary of the Secretary of the Council covered the period annually from Sep-

tember to September is clearly shown in the records of the late treasurer. (See Proc., 1887, p. 444, etc.)

On January 15, 1903 it was moved by S. A. D. Sheppard that the compensation of the person who shall act as Secretary of the Council for the remainder of the unexpired term of Geo. W. Kennedy, who had died on December 22, 1902, be fixed at $75.00. This motion was adopted by vote of the Council.

On January 27, 1903 Dr. H. M. Whelpley was nominated for Secretary of the Council to fill the unexpired term of the late Geo. W. Kennedy, the nomination being made by S. A. D. Sheppard and seconded by C. S. N. Hallberg. Dr. Whelpley was elected by 18 affirmative votes, and was re-elected August 8, 1903; September 8, 1904; September 9, 1905, September 7, 1906; September 7, 1907.

While the Secretary of the Council has, in the majority of cases, been elected in the month of September, the election has also occurred at various other times, such as May, June, July and August, and even April, to suit the convenience of the annual meetings, but the period of time covering the service year must be reckoned from September to September in accordance with the above statements.

After a brief reply by Mr. Whelpley, it was on motion decided that the payment of salary to the former Secretary of the Council as made in November, 1908 be approved.

Chas, Caspari, Jr., made the following report:

In accordance with instructions received, the general Secretary consulted a law firm of Washington, D. C., in regard to the life of the charter of the A. Ph. A., and begs to report that the same is perpetual, as shown in the correspondence herewith submitted.

April 29, 1909.

DR. CHARLES CASPARI, JR., *University of Maryland, Baltimore, Md.*

My dear Dr. Caspari: We have examined the certificate of incorporation of the American Pharmaceutical Association which you sent us with your recent letter, and take pleasure in complying with your request to send you our opinion as to the exact status of that corporation at the present time.

The American Pharmaceutical Association was apparently incorporated under class three of the corporation laws existing in 1888, and these laws will be found set forth in Abert's Compilation of the Statutes in force in the District of Columbia at pages 124–126, and a copy of same is enclosed herewith.

Under class three authority is given to "any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts," to incorporate in the manner in which the members of the American Pharmaceutical Association have done.

No limit whatever is imposed upon the term for which corporations of class three are organized. A limitation of twenty years is imposed upon the life of corporations of class four, which embrace manufacturing, agricultural, mining, mechanical, insurance, mercantile, transportation, market, and savings bank corporations, and such a limitation was originally imposed upon corporations of class three, but that limitation was repealed by an act of Congress approved April 23, 1884.

It is quite probable that some members of your society, having in mind the limitation placed upon the life of corporations comprehended within class four, and which was previously placed upon corporations such as yours, have supposed that the corporate life of your own association has terminated. In view, however, of the repeal of this restriction upon corporations of class three, which comprehends your own association, the corporate life is perpetual. At common law, corporate life is perpetual unless limited by statute or by some provision in the charter. We observe that your charter provides that

"the association shall continue until dissolved by the action of its members or by the operation of law." Not having been dissolved in either of these ways, the corporation would still be in existence, unless there are some other facts which might affect this charter which have not been called to our attention, and we presume that there are not.

We assume, as would appear to be the case from the acknowledgments attached to the original certificate of incorporation, that the majority of the incorporators of the American Pharmaceutical Association were, at the time of incorporation, citizens of the District of Columbia.

Under the laws of the District of Columbia no franchise or annual license tax is imposed upon corporations such as this, nor are they required to file reports of any kind.

Yours very truly, WALTER C. CLEPHANE.

EXTRACTS FROM STATUTES IN FORCE IN THE DISTRICT OF COLUMBIA.

CLASS 3.

Societies—Benevolent, Educational, Etc.

Sec. 27. That any corporation heretofore formed under sections five hundred and forty-five to five hundred and fifty-two, inclusive, of the Revised Statutes of the United States relating to the District of Columbia may avail itself of the provisions of this act by complying with its requirements, and those that this act is intended to amend; but the right to repeal this act, and to alter, amend, or abolish any charter of incorporation granted under it, is expressly reserved to Congress.

Sec. 28. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign and acknowledge, before any officer authorized to take acknowledgment of deeds in the District and file in the office of the recorder of deeds, to be recorded by him, a certificate in writing in which shall be stated—

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized.

Third. The particular business and objects of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

Sec. 29. Upon filing their certificate the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents, and may take, receive, hold, and convey real and personal estates necessary for the purpose of the society as stated in their certificate, and other real and personal property the clear annual income from which shall not exceed in value twenty-five thousand dollars: *Provided, however*, That this section shall not be construed to exempt any property from taxation in addition to that now specifically exempted by law.

Sec. 30. Such incorporated society may elect its trustees, directors, or managers at such time and place and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen in such board of trustees, directors, or managers, the vacancies shall be filled in such manner as shall be provided by the by-laws of the society.

Sec. 31. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including

societies formed for mutual improvement, may, by conforming to the requirements herein reincorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so reincorporated or continued.

Sec. 32. Any property of the corporation may be leased encumbered by mortgage or deed of trust in the nature of a mortgage, or sold and conveyed absolutely, when authorized by a vote of a majority of the directors, managers, or trustees of the corporation, at a meeting called for the purpose, and the Proceedings of which meeting shall be duly entered in the records of the corporation; and the proceeds arising therefrom shall be applied or invested for the use and benefit of such corporation.

Sec. 33. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock, held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

Sec. 34. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the recorder of deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Communication from Surgeon-General Wyman, as follows, was read:

TREASURY DEPARTMENT, WASHINGTON, *June 29, 1909.*

Mr. Charles Caspari, Jr., General Secretary American Pharmaceutical Association, Baltimore, Md.:

Sir: In a letter of November 27, 1908, you forwarded copy of a resolution adopted by the American Pharmaceutical Association at its last annual meeting. In a reply sent you December 2, 1908, it was stated that the Bureau would be pleased to co-operate with your Association, and that the matter would be given consideration. The compilation of a Digest of Comments on the U. S. Pharmacopœia is now in progress, and it is believed that comments on the National Formulary can be compiled at the same time in accordance with the above-mentioned resolution.

In the annual report of the Service for 1908, page 65, reference is made to this letter, and it is there stated that with the knowledge of the American Pharmaceutical Association and the approval of the Secretary of the Treasury the work will be extended to include a digest of comments on the National Formulary. The results will be published as a common volume to be known as "A Digest of Comments on the U. S. Pharmacopœia and the National Formulary."

This matter having been referred to in the annual report of the Service, reply to your letter was inadvertently overlooked.

Respectfully, WALTER WYMAN, *Surgeon-General.*

On motion, it was decided that a vote of thanks be passed to the Secretary of the Treasury and Surgeon-General Wyman for their valuable services to Pharmacy in including a Digest of Comments on the National Formulary with the Digest of Comments on the U. S. Pharmacopœia, the book to be published as a common volume, to be known as "A Digest of Comments on the U. S. Pharmacopœia and the National Formulary."

On motion, it was decided that a committee of three be appointed to formulate rules with reference to the movement for membership proposed by Mr. Beal, and previously adopted.

Applications for membership from numbers 284 to 334 inclusive, excepting No. 310, were elected.

The application of John M. Hogan (No. 310), certificate prize member, presented by the Kansas City College of Pharmacy for 1909, was received, and Mr. Hogan was elected.

The Report of the Auditing Committee was presented and accepted. It read as follows:

ST. LOUIS, MO., *July 22, 1909.*

We have examined the books of Henry M. Whelpley and Chas. Caspari, Jr., respectively Treasurer and General Secretary of the American Pharmaceutical Association, for the fiscal year 1908–9 and compared the records with the vouchers and found them correct. We have found a proper accounting for all of the funds of the Association. The cash balance on June 30, 1909, corresponds with the book of the International Bank of St. Louis and the registered bonds in the hands of the treasurer.

OTTO F. CLAUS.
WILLIAM MITTELBACH.

On motion, it was agreed to amend the sixth general rule of finance by striking out from the last sentence the words "member of the finance committee," and substituting the words "named by the chairman of the Council," so that the rules will read, "There shall be annually appointed by the Council an auditing committee, this committee to consist of three members, residing in or near the same city or town, the chairman to be named by the chairman of the Council."

On motion, it was decided that the Committee on Publication be instructed to designate life members in the roll and list by means of heavy or black-faced type.

It was agreed that the Committee on Finance be requested to inquire into the practicability of having the books of the Treasurer audited by the audit company instead of the Auditing Committee, and to report at the next annual meeting.

On motion, it was decided to table Motion No. 52, contained in Council Letter No. 19, sent out under date of March 27, 1909.

It was decided that the General Secretary, the Secretary of the Council, and the Chairman of the Committee on Membership be directed to formulate rules to govern the allotment of the rebate of one dollar, allowed the local branches for each *new* member obtained.

The Secretary of the Council was requested to advise the local branches that they are entitled to one dollar of the five dollars paid by each *new* member obtained through the branches.

On motion, it was decided that the last sentence of Article 2, Chapter 7, of the By-Laws of the Association be stricken out and that such elision be recommended by the Council to the Association. The sentence referred to reads: "None but ex-officio members of the Council shall be eligible for re-election thereto until one year after expiration of their term of office."

The proposition of H. P. Hynson with reference to the issuance of a general receipt book as contained in Council letter number 24, issued under date of July 14, 1909, was considered, together with letters from Leo Eliel and Otto Raubenheimer as follows:

SOUTH BEND, IND., *July 16, 1909.*

Mr. Joseph W. England, Secretary of the Council, A. Ph. A., Philadelphia, Pa.,

Dear Mr. England: Referring to Council Letter No. 24: The subject matter of the communication from Mr. H. P. Hynson, of course should have our careful attention, as anything coming from him is always entitled to consideration. I fully agree with him in

what he says regarding eliminations from the U. S. P. and N. F., also as to a receptacle. But let us make haste slowly. First of all, let us know what the eliminations are to be. Then we may know if it is worth while for the A. Ph. A. to embark in an enterprise of doubtful utility or profit.

While Mr. Hynson no doubt will bring this up at the meeting, it should not go farther at this time than to have it referred to a committee to report at the 1910 meeting. There is no need for hasty action. Besides we have other opportunities for taking care of eliminations. We already have the "Bulletin." This could be enlarged; it would follow in the footsteps of the Journal of the A. M. A., take advertising matter, thus becoming a source of revenue instead of being an expense. Why could it not take care of the eliminations? And then the eliminations from these eliminations *ad infinitum*.

With kindest regards, sincerely yours, LEO ELIEL.

BROOKLYN, N. Y., *August 10, 1909.*

To the Council of the A. Ph. A.:

Gentlemen: In supporting Prof. Hynson's proposition, that the A. Ph. A. publish a "Receipt Book" (Bulletin, p. 248), I might be permitted to call your attention to the following:

Already at the May meeting of the Philadelphia Branch, in my talk on "Foreign Formularies Compared with our National Formulary," I remarked that the Deutsche Apotheker Verein, Berlin, publishes the Ergänzungsbuch (Supplement to the German Pharmacopœia), which, besides giving formulas, same as our National Formulary, also gives monographs, descriptions, tests and standards of non-official drugs and chemicals. Other nations do likewise.

The Pharmaceutical Society of Great Britain published in 1907 the "British Pharmaceutical Codex," followed by a Supplement, August 1, 1908. The Belgian Pharmaceutical Association in Brussels published its Formulaire National belje de préparations pharmaceutiques, and lately the "Co-operativa Farmaceutica Milano" (Italy) published its "Medicamenta," Guida teorieo-practica per sanitari, a book of 1800 pages.

At the May meeting of the Philadelphia Branch I also called attention, that the Deutsche Apotheker Verein, Berlin, publishes: Vorschriften zur Selbstbereitung Pharmazeutischer Spezialitäten (Receipts for the manufacture of pharm-specialties by the pharmacist himself), 2nd ed. 1906, an interleaved book of 80 pages giving formulas for the preparation of popular galenicals, as elixirs, emulsions, essences, liquors (solutions), pastilles, pills, powders, artificial salts, syrups, tinctures and wines.

The publication of such a "General Receipt Book," as suggested by Prof. Hynson, in my opinion, would be a wise move and furthermore would be an additional source of income to the A. Ph. A.

Respectfully submitted, OTTO RAUBENHEIMER.

It was decided that these communications be referred to the Committee on Standards for Non-official Drugs and Chemical Products for consideration and report.

The following resolution sent by President Oscar Oldberg was presented and recommended to the Association for adoption:

WHEREAS, the Illinois Pharmaceutical Association at its last annual convention adopted the following resolution: "From and after the first day of January, 1910, all applicants for registration and license as registered pharmacists in the State of Illinois shall be required to show to the satisfaction of the Board of Pharmacy that they have completed systematic courses of study in pharmacy, including laboratory work, such as are necessary to the acquisition of the knowledge and efficiency required for the proper understanding of the Pharmacopœia of the United States and the practical application of its directions for the methods of preparation and examination of drugs and medicines,

courses of study and laboratory work to be equivalent to not less than the minimum customarily prescribed for graduation in reputable schools of pharmacy;" therefore be it,

Resolved, That we heartily endorse the intent of the foregoing resolution, and recommend the adoption of similar resolutions by all other state pharmaceutical associations.

Adjourned to meet Thursday, August 17, 1909, at 9:15 a. m.

J. W. ENGLAND, *Secretary of the Council.*

The Chair called for action on the minutes of the Council as read.

On motion of Mr. Beal, seconded by Mr. Hemm, the minutes were approved as read.

Secretary England next read the minutes of third session of the Council held at 9:15 a. m., this day (August 17, 1909).

MINUTES OF THE COUNCIL OF THE A. PH. A.

The third meeting of the Council for 1908–09 was held on August 17, 1909, Chairman Remington presiding.

Members present: Messrs. Remington, Asher, Wilbert, Hallberg, Meissner, Whelpley, Seltzer, Koch, Beal, Caspari, Claus, Eberle and England.

The minutes of the previous meeting were read and approved.

Applications for membership from numbers 335 to 363 inclusive were favorably acted upon.

The Committee on Rules of Finance presented a report, and recommended the following changes:

Rules of Finance.

Rule 5. Strike out the words "Chairman of the Council" and insert in lieu thereof the word "Treasurer."

Rule 8, second paragraph. Strike out the words "Chairman of the Council" and insert in lieu thereof the word "Treasurer."

In Rule 13, before the word "provided," insert the following: "All motions and resolutions involving the expenditure of any amount in excess of $25 shall be referred to the Finance Committee before being acted upon by the Council."

Respectfully submitted, J. H. BEAL,
J. P. REMINGTON.

The Council adopted this report, and on suggestion of committee recommended to the Association the following amendment to the By-Laws:

Chapter V, Article V second line, change the figures $5,000 to $15,000. Fourth line, strike out the words "two sureties or."

C. S. N. Hallberg reported on The Ebert Fund. Action deferred for the present.

The report of the Committee on Standards for Non-official Drugs and Chemical Products was presented, and action postponed.

Adjourned to meet August 18, 1909, at 9 a. m.

J. W. ENGLAND, *Secretary of the Council.*

At request of the Chair, Mr. J. H. Beal proceeded to explain the effect of certain amendments to the By-laws proposed by the Council.

First. That Article V of Chapter V be changed so that the figures "$5,000" in the second line of said article be made to read "$15,000." This, he said, referred to the bond to be given by the Treasurer, who had charge of the funds of the Association. The present bond was $5,000, and the Council recommended an increase to $15,000, on account of the in-

creased responsibility which followed the custody of the invested funds of the Association. Then in the fourth line of said article it was recommended to cut out the words, "two sureties or." The By-law as it now stands says that the Treasurer's bond may be executed by "two sureties or a trust company acceptable to the Council." In the opinion of the Council the day has passed when personal security should be accepted and held sufficient for the responsibility of carrying out a trust such as that involved in holding the funds of the Association. The responsibility is too great to keep with individuals, and the surety companies are organized for that express purpose. The rules of finance are the rules of the Council, and this proposition is approved by the Council, but the Association itself must approve the minutes. The next change proposed in this connection was to strike out of the first line of Rule Five of the Council the words "Chairman of the Council," and insert in lieu thereof the word "Treasurer." Next, in Rule Eight of the Council to strike out the words "Chairman of the Council," in the first line of the second paragraph, and insert the word "Treasurer" in lieu thereof. Mr. Beal explained that under the rule as it stands, the securities of the Association were divided between the Treasurer, who gave bond for the faithful performance of the duties of his office, and the Chairman of the Council, who did not give such bond. In other words, a large portion of the securities under this rule have been held by an official who was not under any sort of bond. Mr. Beal proceeded to explain that the rule as it stood before this amendment required the bank-books, which showed the amount of funds deposited in savings banks, to be in the custody of the Chairman of Council, and these had to be constantly transferred from him to the Treasurer, who lived in a different city, and then sent back again, sometimes involving a transmission of these books perhaps thirty or forty times a year in the mails, and from one side of the country to the other, with the accompanying risk of being lost or destroyed in the mails, thus causing a great deal of inconvenience and possibly some loss to the Association. This was the reason for the proposed change. The last change proposed was one affecting Rule Thirteen of the Council, where the change proposed was to insert before the words "Provided, however," the following: "All motions and resolutions involving the expenditure of any sum in excess of twenty-five dollars shall be referred to the Finance Committee before being acted upon by the Council." Under the practice heretofore existing, he said, the Finance Committee has each year prepared a budget of probable needs for the year ensuing. This budget has been presented to the Council, and, after discussion and amendment, adopted. Following this, when new motions for appropriations have been brought up, they have not been referred to this Finance Committee. So that this anomaly has been presented: That the Finance Committee, after a careful consideration of the needs and resources of the Association, has made a report, which has been duly ap-

proved by the Council, and then when other motions have been introduced adding to this budget, this committee, which must have most of the information at hand, has had no opportunity whatever to pass upon these added expenditures. By the insertion of the clause as read it means that all appropriations in excess of twenty-five dollars must pass through the hands of the Finance Committee, who are better prepared to sit in judgment on them than the members of the Council in general—though it must come to the Council for final action, of course.

The Chair stated that this concluded the business of the Council up to the present, and called for action on the minutes of the Council as read; that the minutes were before the Association for approval—with the exception of the proposed amendments to the By-Laws, as explained, which would have to lie over until the next session, when they could be adopted or rejected, as the Association saw fit. The minutes were accordingly approved, on motion of Mr. A. I. Cohn, seconded by Mr. Whelpley.

The Chair called for the Treasurer's report as the next order of business, and Treasurer H. M. Whelpley presented his report. Before making his report, however, Mr. Whelpley called attention to the provision of the By Laws for an addendum to this report, which was intended to give in a concise manner such information about the work of the year as the Treasurer may believe will be beneficial to the Association. This year, he said, he had included in the addendum some matter of historic interest, so that in the future, by referring to same, the Association might at once learn the status of various funds and other matter up to the date of this report. Said report and the addendum thereto here follow:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1908, TO JULY 1, 1909.

RECEIPTS.

Cash on hand July 1, 1908	$11,231 20
Received from annual dues	9030 00
" " sale of 8 certificates @ $3.00	24 00
" " " " 10 certificates @ $5.00	50 00
" " " " Proceedings	111 91
" " " " Badges and Bars	97 70
" " " " National Formulary	5326 88
" " " " Semi-Centennial Index	12 54
Received interest on deposit in New England Trust Co.	67 95
" " " " International Bank of St. Louis	285 25
Bank Exchange	2 15
Reimbursement for over payment the Keating Co.	5 00
" " " S. A. D. Sheppard	187 50
Rebate on Treasurer Sheppard's Bond	4 42
Received for Semi-Centennial Fund, Interest	15 00
" " Ebert Fund	30 00
" " Procter Memorial Fund	3413 33

Received for Life Membership Fund—			
Edward Kremers ($5.00 paid S. A. D. Sheppard. See cash book, page 88)	$20 00		
Horatio N. Fraser	25 00		
Albert J. Schoettlin (received too late for bank book)	25 00		
Interest 1-1-09 on Mass. State Bond, six months	195 00		
			265 00
Received for Endowment Fund—			
Henry H. Rusby	$5 00		
Edwin J. Thurston	5 00		
S. A. D. Sheppard	1000 00		
Oscar Oldberg	20 00		
E. N. E. Klein	5 00		
James M. Good	20 00		
S. A. D. Sheppard pro rata	26 00		
			1,081 00
Total receipts			$31,240 83

DISBURSEMENTS.

1908.					
August	6.	Check 1417.	C. Lewis Diehl, National Formulary		$45 80
	6.	Check 1418.	Wickersham Printing Co., National Formulary		157 75
	6.	Check 1419.	The Keating Co., Miscellaneous Expenses		10 00
	6.	Check 1420.	E. A. Wright Bank Note Co., Miscellaneous Expenses		33 00
	6.	Check 1421.	C. S. N. Hallberg, June A. Ph. A. Bulletin		107 52
	6.	Check 1442.	C. S. N. Hallberg, July A. Ph. A. Bulletin		103 94
	11.	Check 1423.	Dr. H. W. Wiley, Membership for Assoc. in the International Congress for the Repression of Adulteration of Alimentary and Pharmaceutical Products		4 00
	27.	Check 1424.	Wm. B. Day, Committee on Membership		14 00
	27.	Check 1425.	Buck Printing Co., Printing and Stationery		27 25
	27.	Check 1426.	W. Holzer, Miscellaneous Expenses		2 00
	28.	Check 1427.	Nixon-Jones Printing Co.—		
			Committee on Membership	$12 60	
			Printing and Stationery	12 60	
					25 20
	31.	Check 1428.	C. S. N. Hallberg, A. Ph. A. Bulletin		120 49
	31.	Check 1429.	A. V. Pease, Committee on Membership		4 00
	31.	Check 1430.	R. Albro Newton, Committee on Membership		3 00
September	19.	Check 1431.	Alpha Photo-Engraving Co., Proceedings		44 90
	19.	Check 1432.	Buck Printing Po., Printing and Stationery		1 75
	19.	Check 1433.	Charles Caspari, Jr.—		
			National Formulary	$21 32	
			Proceedings	4 68	
			Badges and Bars	28 08	
			Printing and Stationery	1 25	
			Semi-Centennial Index	1 08	
			Insurance	6 50	
			Premium on Treas. Bond	12 50	
			Miscellaneous Expenses	26 66	
					102 07

September	19.	Check 1434. M. I. Wilbert, Committee on Membership ..		15 00
	24.	Check 1435. Wm. M. Searby, Miscellaneous Expenses...		16 95
	24.	Check 1436. C. Lewis Diehl, National Formulary		22 29
	24.	Check 1437. Henry P. Hynson, National Formulary (Spec. Appro.)		83 40
	24.	Check 1438. M. I. Wilbert, National Formulary (Spec. Appro.)		80 75
	24.	Check 1439. A. B. Stevens, National Formulary (Spec. Appro.)		65 95
	24.	Check 1440. Wilbur L. Scoville. National Formulary (Spec. Appro.)		70 85
	24.	Check 1441. Leonard A. Seltzer, National Formulary (Spec. Appro.)		62 20
	24.	Check 1442. Chas. H. La Wall, National Formulary (Spec. Appro.)		77 45
	24.	Check 1443. C. S. N. Hallberg, National Formulary Spec. Appro.)		52 00
	24.	Check 1444. Joseph W. England, National Formulary (Spec. Appro.)		86 95
	24.	Check 1445. Leo Eliel, National Formulary (Spec. Appro.)		55 50
	24.	Check 1446. H. A. B. Dunning, National Formulary (Spec. Appro.)		83 40
	24.	Check 1447. C. Lewis Diehl, National Formulary (Spec. Appro.)		48 10
	24.	Check 1448. George M. Beringer, National Formulary (Spec. Appro.)		84 45
	24.	Check 1449. H. V. Arny, National Formulary (Spec. Appro.)		60 25
October	1.	Check 1450. H. M. Whelpley, Treasurer ..... Total cash in hand transferred to new Treasurer.		14,080 60
	8.	Check 1451. Charles Caspari, Jr., Traveling Expenses....		109 40
	8.	Check 1452. C. S. N. Hallberg, Bulletin		100 92
	8.	Check 1453. Wickersham Printing Co.—		
		Proceedings	$32 12	
		National Formulary	38 02	
		Miscellaneous Expenses.....	55 85	
				125 99
	8.	Check 1454. E. J. Richardson & Sons, Insurance.....		21 00
	20.	Check 1455. E. J. Richardson & Sons, Insurance..... (This check should have been included with 1454.)		60
	20.	Check 1456. John S. Bridges & Co., Miscellaneous Expenses.		81 75
	20.	Check 1457. C. S. N. Hallberg, Bulletin for October.		106 68
	20.	Check 1458. Chas. H. LaWall, Sec. Education and Legislation.....		12 75
	26.	Check 1459. John S. Bridges & Co.—		
		Committee on U. S. P.	$10 75	
		Printing and Stationery	15 99	
				26 74
	26.	Check 1460. Alpha Photo. Eng. Co., Proceedings		6 25
November	2.	Check 1461. Security Storage and Trust Co., Miscellaneous Expenses.....		10 00

November	2.	Check 1462. C. Lewis Diehl, National Formulary (Spec. Appro.)		750 00
	2.	Check 1463. H. M. Whelpley—		
		Salaries	$62 50	
		Miscellaneous Expenses	9 15	
				71 65
	2.	Check 1464. Am. Bonding Co., Premium on Treas. Bond.		12 50
	9.	Check 1465. J. G. McLean, Stenographer		200 00
	23.	Check 1466. E. F. Greathead—		
		Committee on Membership	$15 00	
		Printing and Stationery	31 90	
				46 90
	23.	Check 1467. Nixon-Jones Printing Co., Printing and Stationery		19 95
	23.	Check 1468. Buxton & Skinner S. Co., Miscellaneous Expenses		22 70
	23.	Check 1469. John S. Bridges & Co., Printing and Stationery		3 90
	23.	Check 1470. C. S. N. Hallberg, Bulletin		117 72
	23.	Check 1471. Frank B. Davis, Miscellaneous Expenses		10 15
	23.	Check 1472. H. M. Whelpley, Miscellaneous Expenses		14 73
	37.	Check 1473. Wickersham Printing Co.—		
		National Formulary	$172 00	
		Proceedings	11 50	
				183 50
	27.	Check 1474. Nixon-Jones Printing Co., Printing and Stationery		35 85
	30.	Check 1475. John S. Bridges & Co.—		
		Printing and Stationery	$6 50	
		Committee on Ed. and Legislation	4 00	
		Committee on Comm. Interests	4 06	
		Committee on Scientific Papers	4 09	
				18 71
December	7.	Check 1476. John S. Bridges & Sons., Sec. on Education and Legislation		4 90
	7.	Check 1477. E. F. Greathead, Printing and Stationery		11 90
	7.	Check 1478. S. A. D. Sheppard, Salary (Returned)		187 50
	7.	Check 1479. Jos. W. England, Salary Sept. 15 to Jan. 1, 1909		87 50
	7.	Check 1480. C. Lewis Diehl, Salary Sept. 1 to Mar. 1, 1909		375 00
	7.	Check 1481. C. S. N. Hallberg, Bulletin, Sept. 1 to Mar. 1, 1909		100 00
	7.	Check 1482. H. M. Whelpley, Salary Oct. 1 to Jan. 1, 1909.		187 50
	7.	Check 1483. Charles Caspari, Jr., Salary		600 00
	14.	Check 1484. Life Membership Fund, Dr. Edward Kremers (Paid May 14, 1908)		5 00
	21.	Check 1485. James H. Beal, Miscellaneous Expenses		8 00
	21.	Check 1486. S. A. D. Sheppard & Co., Miscellaneous Expenses		55 18
	21.	Check 1487. C. S. N. Hallberg, Bulletin		107 08
	21.	Check 1488. F. P. Stroup, Miscellaneous Expenses		19 00

January	2.	Check 1489. Wickersham Printing Co.—		
		Proceedings	$16 57	
		National Formulary	83 16	
				99 73
	2.	Check 1490. Security Storage & Trust Co., Misc. Exp.		10 00
	2.	Check 1491. J. W. England, Miscellaneous Expenses		5 00
	15.	Check 1492. Wickersham Printing Co., National Formulary		21 00
	15.	Check 1493. C. S. N. Hallberg, Membership Campaign		48 32
	15.	Check 1494. Nixon-Jones Printing Co., Printing and Stationery		19 95
	30.	Check 1495. C. S. N. Hallberg, Bulletin.		98 56
	30.	Check 1496. John S. Bridges & Co., Sec. on Practical Pharmacy and Dispensing		3 92
	30.	Check 1497. Alpha Photo Engr. Co., Proceedings		3 70
	30.	Check 1498. H. M. Whelpley, Miscellaneous Expenses		13 65
	30.	Check 1499. International Bank, St. Louis, Miscellaneous Expenses		6 75
February	12.	Check 1500. Nixon-Jones Printing Co., Printing and Stationery		22 40
	12.	Check 1501. Prof. C. S. N. Hallberg, Membership Campaign		50 00
	12.	Check 1502. E. G. Greathead, Printing and Stationery		11 90
	12.	Check 1503. John S. Bridges & Co., Printing and Stationery		23 00
	26.	Check 1504. C. S. N. Hallberg, Bulletin		115 59
	26.	Check 1505. Nixon-Jones Printing Co., Printing and Stationery		16 85
	26.	Check 1506. H. M. Whelpley, Miscellaneous Expenses		2 55
March	9.	Check 1507. Wickersham Printing Co.—		
		Proceedings	$23 00	
		National Formulary	373 50	396 50
	18.	Check 1508. C. S. N. Hallberg, Membership Campaign		77 00
	18.	Check 1509. Wm. B. Day, Committee on Membership		14 00
	18.	Check 1510. E. F. Greathead, Printing and Stationery		3 90
	18.	Check 1511. Nixon-Jones Printing Co., Printing and Stationery		7 65
	18.	Check 1512. Oscar Oldberg, Special Appropriation for President's Expenses		14 00
	18.	Check 1513. F. P. Stroup, Printing and Stationery		24 00
	18.	Check 1514. E. F. Greathead, Committee on Membership.		10 25
	18.	Check 1515. C. S. N. Hallberg, Bulletin		93 07
	18.	Check 1516. Indianapolis Branch, Committee on Membership		6 00
	26.	Check 1517. S. A. D. Sheppard (Treas.), Salary (Sept. 1–Oct. 1, 1909)		62 50
	26.	Cheek 1518. Buxton & Skinner Stationery Co., Printing and Stationery		8 50
	26.	Check 1519. John S. Bridges & Co.—		
		Printing and Stationery	$4 00	
		Committee on U. S. Pharmacopœia.	2 95	
				6 95

March	26.	Check 1520. H. M. Whelpley, Treasurer—		
		Printing and Stationery	$10 92	
		Miscellaneous Expenses	1 10	
				12 02
	26.	Check 1521. Nixon-Jones Printing Co., Printing and Stationery		1 50
	30.	Check 1522. Nellie E. Wakeman, Section on Historical Pharmacy.		25 00
	30.	Check 1523. Grimm Book Bindery, Section on Historical Pharmacy.		25 00
April	5.	Check 1524. Wickersham Printing Co., Proceedings		2,574 22
	5.	Check 1525. C. S. N. Hallberg, Membership Campaign		52 00
	5.	Check 1526. E. F. Greathead, Printing and Stationery		11 00
	5.	Check 1527. John S. Bridges & Co., Section on Scientific Papers		2 95
	20.	Check 1528. I. Bedichimer & Co., Badges and Bars		21 00
	20.	Check 1529. C. S. N. Hallberg, Bulletin		88 71
	20.	Check 1530. John S. Bridges & Co., Printing and Stationery		10 60
	20.	Check 1531. Nixon-Jones Printing Co., Printing and Stationery		3 40
	22.	Check 1532. I. Bedichimer & Co., Badges and Bars		49 00
	22.	Check 1533. Wickersham Printing Co., Proceedings		29 50
	22.	Check 1534. S. G. Adams, Stamp and Seal Co., Miscellaneous Expenses		15 00
May	1.	Check 1535. Security Storage & Trust Co., Miscellaneous Expenses		20 00
	1.	Check 1536. Wickersham Printing Co.—		
		Proceedings	$954 36	
		National Formulary	6 85	
				961 21
	5.	Check 1537. F. W. Nitardy, Committee on Membership		9 00
	5.	Check 1538. Nixon-Jones Printing Co., Printing and Stationery		27 00
	8.	Check 1539. William B. Day, Membership Campaign		45 00
	8.	Check 1540. Wickersham Printing Co., Miscellaneous Expenses		49 08
	8.	Check 1541. Nixon-Jones Printing Co., Printing and Stationery		12 00
	8.	Check 1542. Charles Caspari, Jr.—		
		National Formulary	$27 18	
		Proceedings	14 60	
		S. C. Index	54	
		Badges and Bars	56	
		Journals	30 56	
		Miscellaneous Expenses	7 05	
		A. Ph. A. Charter Advice	10 00	
				90 49
	22.	Check 1543. C. S. N. Hallberg, Bulletin		122 27
	22.	Check 1544. S. G. Adams, Stamp & Seal Co., Miscellaneous Expenses		6 76
	22.	Check 1545. Nixon-Jones Printing Co., Printing and Stationery		37 50

May	22.	Check 1546. E. F. Greathead, Committee on Membership.		5 75
	22.	Check 1547. Nixon-Jones Printing Co., Printing and Stationery		60
June	7.	Check 1548. Nixon Jones Printing Co., Printing and Stationery		10 40
	7.	Check 1549. Oscar Oldberg, Special Appropriation for President's Office Expenses		10 00
	7.	Check 1550. F. P. Stroup, Printing and Stationery		13 00
	7.	Check 1551. A. G. Edwards & Sons, St. Louis City Bonds.		5,282 08
	8.	Check 1552. C. S. N. Hallberg, Membership Campaign		66 05
	8.	Check 1553. H. M. Whelpley, Salary, January 1 to July 1, 1909.		375 00
	8.	Check 1554. C. Lewis Diehl, Salary, March 1 to September 1, 1909		375 00
	8.	Check 1555. Joseph W. England, Salary, January 1 to July 1, 1909		150 00
	8.	Check 1556. C. S. N. Hallberg, Bulletin.		100 00
	8.	Check 1557. Charles Caspari, Jr., Salary, March 1 to September 1, 1909.		600 00
	8.	Check 1558. Frank Hillig, Miscellaneous Expenses		2 50
	8.	Check 1559. John S. Bridges & Co., Printing and Stationery		17 50
	8.	Check 1560. Wickersham Printing Co.—		
		National Formulary	$262 29	
		Proceedings	27 44	
				289 73
	11.	Check 1561. Eckenrode & Myers, Insurance		5 50
	11.	Check 1562. H. M. Whelpley, Miscellaneous Expenses		11 40
	22.	Check 1563. C. S. N. Hallberg, Bulletin		141 36
	22.	Check 1564. Life Membership Fund, Albert J. Schoettlin.		5 00
				$18,686 81
Centennial Fund				15 00
Ebert Fund				30 00
Life Membership Fund				265 00
Endowment Fund				1,081 00
Procter Monument Fund				3,413 33
				$23,491 14

SUMMARY OF DISBURSEMENTS.

Proceedings	$3,742 84
Stenographers	200 00
Journals for Reporter on Progress of Pharmacy	30 56
Salaries ($3,062.50—$187.50 returned=$2,875.00 spent)	3,062 50
Traveling expenses	109 40
Section on Practical Pharmacy and Dispensing	3 92
Section on Education and Legislation	21 71
Section on Commercial Interests	4 06
Section on Scientific Papers	7 04
Section on Historical Pharmacy	50 00
Committee on National and State Legislation	49 08
Committee on Membership	108 60
Printing and Stationery	466 41

A. Ph. A. Charter, Legal Advice	10 00
Insurance	33 60
Badges and Bars	98 64
Miscellaneous Expenses	476 88
National Formulary	2,892 41
Semi-Centennial Index	1 62
A. Ph. A. Bulletin	1,623 90
Ebert Prize	30 00
Centennial Fund	15 00
Life Membership Fund	270 00
Endowment Fund	1,081 00
Procter Monument Fund	2,313 33
Membership International Congress	4 00
Premium on Treasurer's Bond	25 00
New England Trust Co. Collections	1 48
Committee on U. S. Pharmacopœia	13 70
Membership Campaign	338 57
President's Office	24 00
Bond (5—$1,000 St. Louis 4's)	5,282 08
Total Amount of Disbursements	$23,491 14
Cash on hand July 1, 1909	7,749 69
Total	$31,240 83

EXPENDITURES.

	Appropriations.	Expenditures.
Proceedings	$3,500 00	$3,742 84
Salaries	3,000 00	2,875 00
A. Ph. A. Bulletin	1,500 00	1,623 91
National Formulary Meeting at Hot Springs	1,000 00	911 25
Printing and Stationery	525 00	466 41
Miscellaneous Expenses	500 00	476 88
Membership Campaign	340 00	338 37
Stenographer	300 00	200 00
Traveling Expenses	250 00	109 40
Committee on Membership	232 20	108 60
Badges and Bars	118 08	98 64
Committee on U. S. P.	100 00	13 70
Committee on National and State Legislation	49 08	49 08
Section on Practical Pharmacy and Dispensing	50 00	3 92
Section on Historical Pharmacy	50 00	50 00
Section on Education and Legislation	25 00	21 71
Section on Scientific Papers	25 00	7 04
Section on Commercial Interests	25 00	4 06
Insurance	50 00	33 60
President's Office	50 00	24 00
Journals for Reporter on Progress of Pharmacy	35 00	30 56
Certificates	30 00	
Premium on Treasurer's Bond	25 00	20 58
A. Ph. A. Charter Legal Advice	10 00	10 00
Membership International Congress	4 00	4 00
	$11,793 36	$11,223 55
Balance		569 81
		$11,793 36

PROSPECTIVE ASSETS.

Not counting the amount due from members who will probably be suspended for the non-payment of dues, nor from the members whose residence is unknown, there is outstanding on the books of the Association July 1, 1909:

Annual dues for 1908 (224 members)	$1,120 00
Annual dues for 1909 (1214 members)	6,070 00
	$7,190 00

Respectfully submitted, H. M. WHELPLEY, *Treasurer.*

July 1, 1909.

ADDENDUM TO THE TREASURER'S REPORT, 1908–09.

The Treasurer comes in closer touch with the membership than does any other officer of the Association. It is but human nature to speak plainly when the pocket-book is concerned and in collecting the dues, the Treasurer detects the most delicate changes in the beat of the pulse of the organization. My experience with the work of this office since the Hot Springs, Ark. meeting, indicates that the members have a hearty interest in the welfare of the Association and are loyal to the principles on which it is organized.

The Association has had another prosperous year. The rate of increase in membership is greater than ever before and the proportion lost by suspensions smaller. Although expenses have increased the income is sufficient to meet the demand.

Our net balance July 1, 1909, exceeds that of July 1, 1908, by $1,518.49. The especial funds (exclusive of the Procter and Motter Funds) have increased in value $1,872.83, making a total increase of $3,391.32 in assets compared with $4,900.87 increase last year.

The Proceedings contain 121 pages more than last year but cost $279.34 less money ($3,742.84).

The National Formulary netted the Association $1,702.35 less than the previous year. The profit this year was cut down by the expense of the meeting of the Revision Committee at Hot Springs ($911.25), and the $750.00 paid the editor of the National Formulary.

The Special Funds on July 1 are as follows:

	1908	1909
Ebert Fund	$941 96	$949 38
Centennial Fund	2,248 65	2,329 67
Endowment Fund	2,245 31	3,634 35
Life Membership Fund	16,034 55	16,629 90
	$21,670 47	$23,543 30
		21,670 47
Net increase		$1,872 83

The Association Assets may be summed up as follows:

Cash in bank	$7,749 69
Bonds	5,000 00
Available Assets	$12,749 69
Permanent Funds	23,543 35
Total Association Assets	$36,293 04
Procter Fund, held in trust	3,413 33
Grand total	$39,706 37

The Ebert Fund.—Thirty dollars of the $37.42 interest was awarded this year as a prize, leaving the amount of the fund practically as it was one year ago. Before another annual report the generous bequest left the Association by the late Albert Ethelbert Ebert will be added to the present fund.

The Endowment Fund.—This fund, established by the liberal action of Messrs. S. A. D. Sheppard and James H. Beal, September 5, 1906, has grown in size during the past year by several additions. The major contribution ($1,000) came from one of the founders of the fund, Mr. S. A. D. Sheppard, who very generously pays his pro rata on this sum as if it came from some other contributor.

Life Membership Fund.—This has been increased by the interest on bonds and deposits and by the payment of twenty-five dollars from each of the following members who took advantage of the "twenty year" clause: Horatio N. Fraser, Edward Kremers, Albert J. Schoettlin.

The Procter Monument Fund.—Treasurer Benj. J. Fairchild, of the Procter Monument Committee, turned over to the Association $3,413.33 on January 27, 1909. This action was in accord with a motion adopted by the Association September 1, 1907 (Proc. 1907, p. 99). The amount was placed on time deposit in the International Bank of St. Louis January 27, for a period of twelve months at four per cent. per annum. The action was approved by the Council Feb. 26, 1909 (Motion No. 46, Letter 18, p. 41).

The Motter Fund.—The Association holds this fund in trust for the National College of Pharmacy at the request of Murray Galt Motter (see Proc. 1907; p. 54). The amount is $27.58. No draft has been made against this account since it was opened August 4, 1905.

Reinstatement.—One member, Darwin William Irvine has been reinstated during the year by payment of all back dues, according to Article I, of Chapter VIII, of the By-laws. Four were reinstated last year.

The A. Ph. A. Bulletin.—Established January 1, 1906 and now in its fourth year is appreciated by the members.

The cost of publication has been as follows:

January 1, 1906 to July 1, 1906 inclusive	$597 49
July 1, 1906 to June 30, 1907 inclusive	1,456 20
July 1, 1907 to June 30, 1908 inclusive	1,309 30
July 1, 1908 to June 30, 1909 inclusive	1,623 91

The Old Records of the Treasurer dating back to 1886 were turned over to me by my predecessor in office. These included the twenty-two years of correspondence from members of the Association. As time permits I am examining this accumulation of several hundred pounds of material and sending by freight to the historian of the Association, Edward Kremers, the letters and other documents not in use in the present conduct of the office of treasurer. I suggest that the old records of other officers can be appropriately placed in the same archives of the Association.

This is my first annual report as Treasurer and I thank my associate officers, particularly the General Secretary, for full coöperation and generous support in my efforts to become familiar with the work of my new office. I must also bear testimony to the perfect condition in which the books and records were turned over to me October 1, 1908 by S. A. D. Sheppard who had conducted the office of Treasurer for a period of twenty-two consecutive years in a masterly manner. I cannot expect to replace his wonderful personality in the Association but will be content if I succeed in coutinuing the office of Treasurer in the efficient manner evidenced by his records.

Very truly, HENRY M. WHELPLEY, *Treasurer.*

July 1, 1909.

Mr. Whelpley then went on to say that one of the duties of the Treasurer which was not quite so pleasant or gratifying as that of reading his annual report was to present annually to the Association a list of members who had neglected to pay their dues for three consecutive years, and who, unless some kind friend could prevail upon them to make these dues good, would have to be published in the Proceedings as suspended, under the By-Law, for non-payment of dues. He said he had this list with him and proposed to read it, in the hope that some of those present would recognize an acquaintance among them to whom they could speak, and thus perhaps save to the Association the names of some of these parties. He then proceeded to read the list.

Mr. Hallberg asked Treasurer Whelpley what efforts had been made to collect the dues of these delinquents, and he replied that all these parties owed dues for the years 1907, '08 and '09. Just what efforts were made previous to his election as Treasurer he could not state positively, but he did know that each one had received at least four notices each year during the period of their delinquency. He also stated that, since the Hot Springs meeting last year, he had sent to each one of these parties seven different communications, the last one a printed slip stating that unless he received the necessary $5.00 from them previous to this meeting their names would be read at this time for the action of the Association. That had worked in several instances. Mr. Hallberg suggested that the Treasurer send out a list of these delinquents early in the year to the various branches, so that they might have an opportunity to bring the members in. To cast a little side-light of humor upon this rather dull proposition of dealing with delinquents, Mr. Whelpley related an incident connected with his efforts to reduce this list of delinquents, where one member had replied that he thought he was a little bit too aggressive in his efforts to collect these dues; that members were a little sensitive about being reminded of delinquent dues.

The Chair called for action on the report of the Treasurer as submitted, stating that the report had already been passed upon by the Auditing Committee. Thereupon Mr. Cook moved to receive and adopt.

Mr. Rusby asked for an explanation of the item of nine hundred and some odd dollars for the expenses of the Revision Committee on National Formulary at the Hot Springs meeting, and the Treasurer replied that the Council of the Association, about a year ago, had appropriated a sum not to exceed $1,000 to provide for the expenses of the meeting of the Committee on National Formulary at Hot Springs immediately preceding the meeting of the Association in 1908, and of that amount nine hundred and some odd dollars had been used by the committee. Mr. Rusby expressed his satisfaction at this explanation, and said that he had asked for the information because he thought some of the members might get the idea that the Association was paying the expenses of the Revision Committee of the Pharmacopœia, and he wanted to have that impression corrected.

Mr. Valentine Schmidt, of San Francisco, asked if the delinquent members had received a copy of the Proceedings of this year, and the Treasurer replied that they had not.

Thereupon the Chair put the vote upon the motion to receive and adopt the report of the Treasurer as read, and it carried.

Treasurer Whelpley then stated that he was gratified to report to the Association a satisfactory growth in the Endowment Fund established by the generosity of Messrs. Sheppard and Beal, and he read the following communication from Mr. Charles E. Dohme, of Baltimore, enclosing his check for $1,000 as his contribution to this fund:

Baltimore, July 1st, 1909.

DR. H. M. WHELPLEY, *St. Louis, Mo.*

My dear Dr. Whelpley: I send you enclosed New York draft for one thousand dollars, being my subscription to the A. Ph. A. Endowment Fund, which I had promised to my friends, S. A. D. Sheppard and Jas. H. Beal, when we met in Boston about a year ago, and which until now I have had no opportunity to liquidate. I trust it will reach you in good time before your departure to Los Angeles, and to enable you to inform the members of the Council of the A. Ph. A. when you meet them at the meeting in that city early in August.

I have delayed sending this draft to you ere this, as I was still in hopes, until quite recently, that I might be able to be with you at this most interesting meeting, but my state of health, and much also the continued hot and oppressive weather, would make it almost suicidal on my part to attempt so long a railroad trip. Much as I regret not to be able to meet the members of the Council and so many of my friends generally who will be present in Los Angeles, and much as my wife and daughter, who intended to accompany me on this occasion, desired to be there, I was compelled finally to decide in the negative and try some other feasible method of getting in better shape before going on so long a railroad trip in this hot weather.

I trust that you will mention it to all the members of the Council, as also the many friends I have in California and the Association generally, how sorry I am not to be able to be with them in Los Angeles. I know that I would have enjoyed meeting them all, and I am sure that many of my friends would like to see me again, but I trust ere long that I may be able at an early future meeting of the Association to have the pleasure of greeting them again and taking them by the hand.

Remember me most kindly to all my friends, and particularly those who were present at the meeting twenty years ago, of whom I know many will be present, and assure them that were it not for the condition of my health I would have been present at this meeting and had the pleasure of seeing them.

I trust the draft which I have sent you, made payable to you as Treasurer of the Endowment Fund, will give you an opportunity of greeting my many friends when you present same, and wish them all a very happy and delightful time in Los Angeles and in the coming year generally.

With kindest regards to yourself and Mrs. Whelpley, I remain,

Yours most sincerely, CHARLES E. DOHME.

The reading of this letter was greeted with hearty applause by the members.

The Chair stated that a letter of this kind must be very gratifying to the members of the Association: that Mr. Dohme was one of the staunch

members and leaders of the American Pharmaceutical Association, and that all missed him when he was absent from these annual meetings, which has been the case several times in the last few years. He said that the members always thought of him, as it was evident he thought of them.

Mr. F. W. Meissner suggested the appointment of a committee to draft suitable resolutions acknowledging the receipt of this letter and the handsome sum given the Endowment Fund, and expressing the appreciation of the Association of Mr. Dohme's generosity. This motion was seconded by Mr. Beal and Mr. Hemm, and was carried unanimously. The Chair did not appoint this committee at the time.

The Secretary's report was the next order of business, and that officer read his report as follows:

REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF THE NATIONAL FORMULARY FROM JULY 1, 1908, TO JUNE 30, 1909.

I. Receipts.

From Sales and Payment of Bills due July 1, 1908		$5,326 88

II. Expenditures.

Paper and Press Work, 3,105 copies @ 8.55 cts.		$265 43	
Binding 5,105 copies cloth @ 11½ cts.	$587 07		
Binding 50 copies cloth int. @ 20½ cts.	10 25		
Binding 550 copies sheep @ 28½ cts.	156 75		
Binding 100 copies sheep int. @ 37½ cts.	37 50		
		791 57	
Traveling and Hotel Expenses of thirteen Members of the National Formulary Committee		911 25	
Honorarium paid to Chairman of the Committee		750 00	
Expressage and Postage		194 71	
43 Mailing Boxes @ 25 cts		10 75	
Typewriting done at Office of the Chairman		57 60	
Changes made in the Electrotyped Plates		8 85	
2,500 Errata Slips		3 50	
Telegrams, $1.50; Twine, $0.50		2 00	
			2,995 66

III. Remittances.

To Treasurer, as per Treasurer's Receipts	5,326 88

IV. Sales.

To Dealers and Individuals, as per Ledger Accounts	5,197 58

V. Accounts Unpaid.

By Dealers	719 68

VI. Bills Due by the Association.

For Binding 650 copies in cloth @ 11½ cts.	$74 75	
For Binding 100 copies sheep @ 28½ cts.	28 50	
		103 25

VII. Stock on Hand.

Copies in flat sheets (unbound)		0
Copies bound in cloth		1,003
Copies bound in cloth, interleaved		33
Copies bound in sheep		106
Copies bound in sheep, interleaved		122
		1,264

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF THE NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1908 (see Proc., Vol. 56, p. 484)	$30,837 10	
Receipts from July 1, 1908, to June 30, 1909	5,326 88	
		$36,163 98
Expenses to June 30, 1908 (see Proc., Vol. 56, p. 484)	$17,544 96	
Expenses from July 1, 1908, to June 30, 1909	2,995 66	
		20,540 62
Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1909		559 62
Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1909		649 45

C. SALE OF PROCEEDINGS.

Receipts from July 1, 1908, to June 30, 1909	111 91
Remitted to Treasurer, as per Treasurer's Receipts	111 91

D. TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF SEMI-CENTENNIAL INDEX.

Total Receipts from July 1, 1903, to June 30, 1908	$2,294 37	
Receipts from July 1, 1908, to June 30, 1909	12 54	
		2,306 91
Total Expenses from July 1, 1903, to June 30, 1908	$3,122 50	
Expenses from July 1, 1908, to June 30, 1909	90	
		3,123 40

E. ACCOUNT OF BADGES AND BARS.

Receipts from Sales of Badges and Bars from July 1, 1908, to June 30, 1909.			97 70
Remitted to Treasurer as per Treasurer's Receipts			97 70
Stock on Hand July 1, 1909	Gold Badges, 31; Gold Bars, 77		
Total Receipts from Sales of Badges and Bars to July 1, 1908 (see Proc., Vol. 56, p. 484)		$1,402 55	
Receipts from Sales from July 1, 1908, to June 30, 1909		97 70	
			1,500 25
Total Cost of Badges and Bars to July 1, 1908 (see Proc., Vol. 56, p. 485)		$1,343 13	
Cost of 40 Gold Badges	$70 00		
Cost of 40 Gold Bars	28 00		
Registration Fees	56		
		98 56	
			1,441 69

Baltimore, July 1, 1909.

CHAS. CASPARI, JR., *General Secretary.*

On motion of Mr. Wilbert, seconded by Mr. Claus, the report of the General Secretary was accepted as read.

The Chair announced that the reports of Standing Committees were next in order, and called for the report of the Committee on United States Pharmacopœia. Mr. Hallberg stated that Mr. Beringer, of the committee, had sent the report to him as a member, he not being able to be present. He moved that the report be referred to the Committee on Scientific Papers, to be presented and discussed there, provision having been made for that purpose in the program of the Scientific Section. This motion was seconded by Mr. Beal and others, and carried.

Mr. Seltzer presented the following report of the Committee on Credentials, which was, on motion, ordered to be published:

REPORT OF THE COMMITTEE ON CREDENTIALS.

To the President and Members of the American Pharmaceutical Association:

Your Committee on Credentials beg leave to report that they have examined the credentials presented by the delegates of the various organizations named below, and find them in proper form:

Colleges of Pharmacy—Albany, Brooklyn, California, Louisville, Maryland, Massachusetts, New Orleans, New York, Philadelphia, Pittsburg.—10.

School of Pharmacy—University of Illinois, University of Maryland, University of Minnesota, University of Washington, Southern California University, Vanderbilt University, Ohio State University.—7.

State Pharmaceutical Associations—Alabama, Arkansas, California, Colorado, Connecticut, Florida, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia.—30.

Alumni Associations—New York College of Pharmacy, Northwestern University School of Pharmacy, Philadelphia College of Pharmacy.—3.

National Associations—American Medical Association, National Association of Retail Druggists, National Wholesale Druggists Association.—3.

Local Associations—Denver Pharmaceutical Association.—1.

United States Government Service—Bureau of Medicine and Surgery of the U. S. Navy, Public Health and Marine Hospital Service.—2.

LEONARD A. SELTZER, *Chairman*,
MARTIN I. WILBERT,
F. C. GODBOLD.

The Chair called for report from the Committee on National and State Legislation, Samuel L. Hilton, Chairman. The General Secretary stated that the report had not reached his hands. He suggested that Mr. H. B. Mason was a member of that committee, and might give some information concerning it. Mr. Mason stated that he understood the report was to be mailed directly to the Council, or to the President, by Mr. Hilton, of Washington, D. C., Chairman of the Committee. He had received a copy of the report as a member of the committee a month or two ago, but had returned it to Mr. Hilton with the suggestion of certain changes; he had not heard from him since. He himself had not been requested by Mr. Hilton to present the report to the Association, and in fact knew nothing

about it beyond what he had stated. The Secretary then suggested that Mr. Lyman F. Kebler, of Washington City, might possibly bring the report with him, but that the gentleman had not yet arrived. And so the matter was passed for the time being.

The next report called for was that of the Committee on Transportation, Caswell A. Mayo, of New York City, Chairman.

It read as follows:

REPORT OF COMMITTEE ON TRANSPORTATION.

NEW YORK, *August 9, 1909.*

Your Committee beg leave to report that owing to the extent and variety of the attractions in the territory in which the meeting is held this year, the work of the committee was very much increased and the difficulties which presented themselves to arrange a route which would suit all the visiting members, proved insurmountable. Fortunately, the low rates made by the transportation companies proved sufficient to interest many members in the eastern section of the United States, and while the effort to arrange for special trains over the two routes particularly recommended was ineffectual, a goodly number have adopted the suggestion of the committee. The railway companies have circularized the members of the Association quite freely without expense to the Committee; consequently, your committee has no item of expense to report, each member having cheerfully contributed such sums as was necessary to defray his individual expenses in correspondence, etc.

Respectfully submitted, CASWELL A. MAYO, *Chairman.*

The report of the Committee on Time and Place of Next Meeting was called for, and the General Secretary suggested that Chairman Engstrom, of that committee, had a report, and moved that it be deferred for the time being. So ordered.

The Chair stated that reports from the Special Committees of the Association were next in order, and called on the Committee on Organization of Local Branches for report. Chairman Searby made the following report for that committee:

REPORT OF THE COMMITTEE ON LOCAL BRANCHES.

Your committee are pleased to report that four local branches have been established, viz.: New Orleans, Denver, Indiana and Pittsburg, and that a fifth is in process of organization on the Pacific Coast. Owing to the magnificent distances from each other of the large cities on this Coast in which the members chiefly reside, some difficult problems in regard to the times and places of meeting have to be dealt with, but we are not discouraged by these difficulties. It is to be hoped that the benefits of the work of this branch will be so manifest that one or possibly at a later period two additional branches will grow out of the original one.

W. M. SEARBY, *Chairman.*

The Secretary said that the report of the Committee on the William Procter, Jr., Monument Fund was in his hands, having been sent to him by Chairman Hancock, of Baltimore, and he would read it:

REPORT OF THE COMMITTEE ON THE WILLIAM PROCTER, JR., MONUMENT FUND.

To the President and Members of the A. Ph. A.

Gentlemen: Your committee made a report of progress at the last year's annual meeting and explained the cause of the comparative inactivity of the committee in collecting funds. Another year much like the last has also prevented active efforts and but little has been added to the sum reported in 1907.

The financial conditions of trade and the disturbed conditions in pharmacy owing to unusual attention to legislative matters seem to have passed the critical stage and the time has arrived for the revival of business. Your committee fully realizes the importance of immediate renewal of work and a more earnest effort to secure the sum necessary for the erection of the monument at an early date. In 1917 there will occur the centennial of the birth of the father of American pharmacy—the late William Procter, Jr. By that time we should be ready to dedicate a substantial and fitting monument in the Smithsonian Grounds at Washington, D. C. The pharmacy of this country is worthy of this distinction, and the life work and character of Procter make him the unanimous choice for this honorable tribute.

We believe that when the pharmacists of North America are made to realize the importance of this work and duty, and the opportunity is offered and urged in every state and territory, the money will be quickly subscribed. Therefore your committee contemplates a hearty co-operation of all who appreciate the importance of pharmacy to the medical profession and to the public in general.

The effort will be made in the coming year to create an interest in every state of the Union, that it may be a co-operative and unanimous work to the honor of pharmacy.

The Chairman has not been able to collect full details of what has been done during the past year, but will soon be able to secure the names and addresses of all subscribers that have not been published in past proceedings of the Association, and will report same in detail to the General Secretary, so that they may be published in the Proceedings of this year, to the time of the report.

J. F. HANCOCK, *Chairman.*

August 1, 1909.

The following are the names of subscribers to the William Procter, Jr., Monument Fund, which have not been given in the previous issues of the proceedings of the A. Ph. A.

*William Saunders, Cent. Experimental Farm, Ottawa	$5 00	Nils G. Kant	5 00
John A. Dunn, 36 Doughty St., Brooklyn, N. Y	5 00	John G. Wishcherth	2 50
A. M. Roehring, U. S. Marine Hosp., Stapleton, S. I	5 00	Gustavus Balser	10 00
C. G. Bruckman	1 00	Thomas F. Raymow	1 00
M. C. Condello	1 00	J. T. Tengelsen	2 00
Fred. P. Tuthill	1 00	Thomas J. Keenan	1 00
Oscar Kleine	1 00	Willis G. Gregory	1 00
F. E. Kalbrenner	1 00	G. C. Diekman	1 00
A. D. Linderman	1 00	E. R. Squibb & Sons	50 00
Peter W. Ray	1 00	Richard Hudnut	2 00
Adrian Paradis	1 00	Warren L. Bradt	1 00
		Byron M. Hyde	1 00
		S. A. Grove	1 00
		J. C. Krieger	2 00

* Inadvertently omitted in the report of 1905.

Joseph Kahn	1 00	I. L. Lyons & Co., New Orleans..	5 00
A. E. Dall & Co.	2 00	George Humphries, New Orleans.	1 00
Carl Mittinzweig	1 00	R. E. Blanchard, New Orleans...	1 00
W. H. Weygandt	1 00	W. P. Bradburn, New Orleans...	1 00
H. Benatar	1 00	Chas. Nicaud, New Orleans	1 00
W. C. Anderson	2 00	Henry Welsch, New Orleans	1 00
Jacob Lauffer	1 00	J. N. W. Otto, New Orleans	1 00
Chas. Heimerzheim	1 00	John A. Wellington, New Orleans	5 00
South Dakota Pharmaceutical Association	50 00	T. J. Labbie, St. Martinsville, La.	1 00
		Michael Bernstein, Shreveport, La.	1 00
Wm. Mittelbach, Boonville, Mo..	5 00	A. D. Trapani, New Orleans.....	1 00
J. H. Rehfus	2 00	A. Villeret, Bayou Sara, La.. ...	1 00
W. Bussenschutt	1 00	I. L. Lyons, Jr., New Orleans....	1 00
A. E. Hegeman	1 00	Philip Asher, New Orleans.....	1 00
Chas. I. Gessell	1 00	E. W. Rybiski, Donaldsville, La..	1 00
L. C. Bossardet	1 00	M. Stolzenthaler, New Orleans...	1 00
E. J. Kennedy	1 00	L. B. Diez, New Orleans	1 00
A. P. Lohness	1 00	R. F. Grace, New Orleans.....	1 00
George Kleinau	1 00	M. T. Breslin, New Orleans	2 00
Julius Kalish	10 00	Wm. M. Levy, New Orleans	1 00
F. B. Hays	1 00	C. D. Sauvinet, New Orleans....	1 00
Jos. Weinstein	1 00	Jos. T. Balter, New Orleans.....	1 00
Daggett & Ramsdell	5 00	J. N. Richard, Bayou Goula, La..	1 00
James I. Dykes	1 00	G. W. McDuff, New Orleans....	1 00
Thomas Stoddart	10 00	Adam Wirth, New Orleans.....	1 00
Judson B. Todd	1 00	Adolph Noha, New Orleans.	1 00
Chas. B. Sears	1 00	A. Levy, New Orleans.....	1 00
John Hurley	2 00	J. P. Williams, Wilmington, Del.	1 00
George Beimann	1 00	T. B. Cartmell, Wilmington, Del.	1 00
H. W. Schimpf	2 00	C. M. Allmond, Wilmington, Del.	1 00
O. T. Larkin	1 00	W. F. Dunn, Wilmington, Del...	1 00
Fred. Menges	2 00	O. C. Draper, Wilmington, Del...	1 00
Henry B. Lentz	1 00	E. Hoffman, Wilmington, Del. ..	1 00
William H. Rogers	2 00	N. B. Danforth, Wilmington, Del.	2 00
V. I. Cole	1 00	John M. Harvey, Wilmington, Del.	1 00
Clarence O. Bigelow	5 00	H. K. Watson, Wilmington, Del.	2 00
D. B. Guilford	5 00	F. E. Gallagher, Wilmington, Del.	1 00
T. B. McKane	2 00	J. T. Challenger, Wilmington, Del.	1 00
Lehn & Fink	10 00	F. J. Harmoson, Wilmington, Del	1 00
J. B. Sackett	5 00		
F. C. Godbold, New Orleans	5 00	A. P. Sharp, Baltimore, Md.	20 00
Parker, Blake & Co., New Orleans	5 00	Resinol Chemical Co., Baltimore, Md	10 00
Finlay Dicks & Co., New Orleans.	5 00		

Collected at the annual meeting of the New York State Pharmaceutical Association held at Richfield Springs, 1909, by Thomas J. Keenan.

Peter Diamond	2 00	Mrs. M. E. Gesell	1 00
William Muir	1 00	E. S. Dawson	1 00
Joseph Kahn	1 00	H. H. Rusby	1 00
Hugh Craig	1 00	Frank Richardson	1 00
R. F. Hetherington	1 00	J. Weinstein	2 00
W. C. Anderson	1 00	L. J. Cohen	1 00
Thomas F. Main	1 00	G. T. Riefflin	1 00

Robert S. Sloss	2 00	Louis E. Feindt, South Orange, N. J.	5 00
J. M. McCullough	1 00	Charles F. Dare, Bridgeton, N. J.	5 00
A. H. Maloney	1 00	Henry E. Wrensch, Jr., Montclair, N. J.	5 00
L. Berger	1 00	W. Pitt Rich	5 00
C. A. Drefs	1 00	H. C. Neer, Park Ridge	2 00
A. Katzman	1 00	F. C. Stutzlen, Elizabeth, N. J.	2 00
Thomas Stoddart	1 00	P. E. Hommell, Jersey City, N. J.	3 00
W. L. DuBois	1 00	E. P. Nichols, Killingworth, Conn.	1 00
John C. Krieger	1 00	J. C. Thatcher, East Millston, N. J.	1 00
A. S. Van Winkle	1 00	W. H. Lanson, Madison, N. J.	1 00
M. H. Greenland	50	A. L. Prince, Paterson, N. J.	1 00
A. Worthington	5 00	J. M. Peterson, Rutherford, N. J.	1 00
Robert W. Gardner, Bloomfield, N. J.	25 00	Joseph G. Smith, Rahway, N. J.	1 00
Charles Holzhauer, Newark, N. J.	25 00	Wm. L. Boice, Irvington, N. J.	1 00
Roeber & Kuebler, Newark, N. J.	25 00	Herman Weller, Hoboken, N. J.	1 00
George M. Beringer, Camden, N. J.	10 00	George S. Campbell, Milburn, N. J.	1 00
Edward A. Sayre, Newark, N. J.	10 00	H. J. Lohmann, Jersey City, N. J.	1 00
H. H. Rusby, New York	5 00	George H. Homing, Rosette Park, N. J.	1 00
F. A. Seaman, Perth Amboy, N. J.	5 00	Charles Foulke, Jersey City, N. J.	1 00
L. L. Staehle, Newark, N. J.	5 00	Adolph Franck, Hackensack, N. J.	1 00
August Drescher, Newark, N. J.	5 00	Charles C. Field, Plainfield, N. J.	1 00
David Straus	5 00		
E. B. Jones, Mount Holly	6 00	Total	$551 00
F. A. Bongartz, Jersey City	5 00		
Henry Schmidt, Elizabeth, N. J.	5 00		

The Chair called for action on the report just read, and on motion of Mr. Wilbert, seconded by Mr. Ladish, the report was accepted.

The report of the Committee on Publicity was presented by Chairman Francis B. Hays, of New York, in brief abstract, the full text of the report being as follows:

REPORT OF COMMITTEE ON PUBLICITY.

To the Officers and Members of the American Pharmaceutical Association.

For five years now this Association has had a Committee on Publicity, a new one each year. So far as the present committee has been able to ascertain, the net results of the labors of the other four have not been such as to justify the originator of the plan to create such a committee in any expectation he may have had as to the good which it would accomplish. This statement is not intended as a reflection on any one, as the several members of the present committee have been on one or more of the preceding four, and each of two of them, including the chairman, has been chairman of one of the other four. Your committee, therefore, in submitting a report of small accomplishment, is merely following a firmly established precedent.

Upon being notified of the personnel of the committee and his own appointment as its head, the chairman passed the word along to his associates and asked them for their co-operation. They replied with a promptness and unanimity that is often wanting in committee work—to the effect that they were as busy as they could be with other affairs of the Association and their own, and could not be counted on for any active support. The chairman, too, has had more work to do in other fields than he could possibly

accomplish, and has been obliged to relinquish some of it: he has been unable to give more than very slight attention to the work of the committee.

Several hundred—perhaps a thousand or more—printed copies of the resolutions adopted by the Association at Hot Springs last year relative to the advertisements of nostrums appearing in the daily press under the guise of disinterested advice by the editor or some staff contributor were received by the committee from the General Secretary of the Association early in the year. Unfortunately these bore no date or stamp of authority, and this fact was given by the manager of the New York office of the Associated Press for their non-recognition by his office. During the annual meeting of the Associated Press and the American Newspaper Association at New York in April last packages of these reprints were addressed to the secretaries of the two organizations, respectively, and sent by messenger to the place of their meeting. When the committee wrote later to inquire what action had been taken on them by the associations the answer came back that the packages had never been received.

Several of these reprints were sent to the local branches of the Association, and reports of action on them were received from the branches at Chicago, Cleveland and Minneapolis-St. Paul. In Cleveland, H. V. Arny reports that three of the four daily papers gave some publicity to the gist of the resolutions, and in Minneapolis, F. J. Wulling reports that the *Journal* and the *Daily News* have refused objectionable medical and fraudulent advertising, at a loss, he believes, in one case, of $20,000 annually. In addition to this E. G. Eberle, of Dallas, Texas, wrote strong letters, embodying the resolutions, to a number of papers in his section of the country, warning them that such an abuse of the confidence of their readers as was mentioned therein would lead to the passage of a pure advertising law, and he reports that he is satisfied that his letters have done much good, and may do more.

As it would cost some $400 in postage alone, besides the expense for stationery, printing and mailing, to reach the 20,000 daily and weekly newspapers of the country, the idea of distributing the reprints in this way was not entertained by the committee.

As we are unable to report much work done, perhaps a little historical sketch of the origin and progress of the committee may serve to divert attention from our remissness.

President Lewis C. Hopp, in his address delivered at the Kansas City meeting in 1904, recommended the appointment of a committee on publicity. This recommendation was heartily concurred in by the committee to which the address was referred, consisting of F. W. Meissner, Jr., F. C. Godbold, and C. A. Rapelye. Secretary Caspari raised the point of expense, and the matter was referred to the Council. (Proceedings, 1904, pages 4, 48 and 49.) On February 17th, 1905, Chairman Beal, of the Council, offered a resolution authorizing the President of the Association to appoint a Committee on Publicity to act until the next annual meeting and to report a plan for the organization and work of a standing committee of like character. This resolution being adopted, President Beal appointed as such committee the following pharmaceutical journalists: H. M. Whelpley, W. R. Ogier, H. B. Mason, E. J. Kennedy, Henry Kraemer, C. A. Mayo, G. E. Gibbard, G. P. Engelhard, R. G. Eccles, Edward Kremers, F. L. James, and Francis B. Hays (chairman).

This committee reported to the Council at the Atlantic City meeting in 1905, and the report was referred to L. C. Hopp and E. H. Gane. These gentlemen brought in a comprehensive report on the method of organizing the committee on publicity and on the duties it should perform. About the same time the Council created the office of reporter to the public press, and on motion it was ordered that the member holding that office should be Chairman of the Committee on publicity and editor of the A. Ph. A. Bulletin. C. S. N. Hallberg was unanimously nominated by the Council for the position.

When the new Council went into office at the Atlantic City meeting, on motion of Leo Eliel, the motion consolidating the three offices was reconsidered, and C. S. N.

Hallberg was elected editor of the "Bulletin," the undersigned Chairman was made reporter to the public press, and the appointment of the Committee on publicity was left to the President-elect. Accordingly President Lemberger appointed the following as that committee: E. H. Gane, of New York, Chairman; H. M. Whelpley, of St. Louis; and C. A. Mayo, of New York. (Proceedings, 1905, pages 20, 54, 58, 60, 61, 62 and vj).

Chairman Gane made a systematic effort to enlist the coöperation of members to put into effect the comprehensive plan reported to the Council by himself and Mr. Hopp, but with rather disappointing results. President Eliel continued Mr. Gane as Chairman of the committee during 1906–1907 with Mr. Mayo and Frank L. James, of St. Louis, as associates. (Proceedings, 1906, pages 72 and vj.) No mention of a report by this committee is found in the Proceedings for 1907, but the present committee is informed by Mr. Gane that he made an oral report at the meeting and afterward submitted a written one to the proper authorities.

President Searby appointed as the Committee on Publicity for 1907-8: C. A. Mayo, of New York, chairman; Henry Kraemer, of Philadelphia, and Albert Schneider. At the Hot Springs meeting held in 1908, Chairman Mayo recommended that the reporter to the public press be made Chairman of the Committee on Publicity, and President Oscar Oldberg appointed your present committee, the Chairman of which is also reporter to the public press. (Proceedings, 1908, pages 532 and vij.)

Your committee feels that on the whole the plan of the Association to gain prestige and members by means of publicity through the public press after five years' trial has not been successful, and it believes this to be due to three factors, namely: (1) A feeling on the part of the various committees that they would not be justified in inaugurating an expensive campaign for publicity; (2) a lack of active and hearty coöperation on the part of the members throughout the country who might be able to reach and influence their local press; and (3) the seemingly rather general indisposition of the lay press to concern itself with the affairs of pharmacy. Your committee, unfortunately, has no plan to offer by which it thinks these three factors may be eliminated, but it again calls attention, with approval, to the publicity work done by Mr. Eberle.

Respectfully submitted,

HARRY B. MASON,
CASWELL A. MAYO,
FRANCIS B. HAYS, *Chairman.*

Los Angeles, August 16, 1909.

On motion of Mr. W. J. Frazier, of Wichita, Kansas, duly seconded, the report just read was adopted.

The report of the Committee on Reorganization was called for, and Mr. Hallberg, Chairman, stated that he had such report but had mislaid it for the time being. He said the committee had made no recommendations. He promised to get the report and hand it in later, and with this understanding the matter was deferred until the next session.

The report of the Committee on Membership was next called for, and Mr. Hallberg, of that committee, in the absence of Chairman William B. Day, of Chicago, read the report, as follows:

REPORT OF GENERAL MEMBERSHIP COMMITTEE.

The Chairman of the committee with the co-operation of the editor of the "Bulletin," according to instructions, began a systematic campaign for members early in December last year.

The work was continued steadily for eight months, or until August 1st, with the results shown in the appended table.

The following lists of names of prospective candidates were secured from members and from other sources, and to each person a series of five letters were sent at intervals of from two to four weeks:

A. List of 700 from about twenty different States.

B. List of 350 from about twenty different States (including some of those in List A).

C. List of 120 Board of Pharmacy members.

D. Miscellaneous: Officers of State Associations, etc.

The members of the General Committee were also kept informed and asked to co-operate, especially at the State Pharmaceutical Association meetings.

Nearly 6,000 individual letters were written during this time, and nearly as many Bulletins sent out.

The results speak for themselves.

Up to August 1st over 220 subscriptions had passed through the office, the receipts amounting to $1,100.

The entire expense was $438, a little more than the $50 per month estimated, or $55 per month.

If the work is to be continued the appropriation should be not less than $60 per month, since the work cannot be satisfactorily done for any lesser amount. It should begin in October and continue to August 1st, so that in the month of July the work may be brought to a satisfactory conclusion. It is believed that pharmacists would be more interested in the Association, and a larger membership be thus secured, if the Bulletin were enlarged, so as to stimulate the many committees of the Association in their work, and thus more strongly reflect all the varied activities of the Association.

The campaign just closed has brought altogether over 300 new members into the Association, a larger number than ever before, and if the friends on the Pacific coast have not exhausted their possibilities, the goal of 500 new members may yet be reached this year.

It will be observed that in several of the older and populous States very few or no new members have been secured, while in some of the newer distant States a decided increase is shown.

It is recommended that at least one member in each State be asked to pledge himself to present the cause of the A. Ph. A. at the next meeting of his State Pharmaceutical Association and secure a goodly number of members.

It is also recommended that such members arrange that the American Pharmaceutical Association be given place on the program of the State Association, and that he or some other member be present and speak in its behalf.

Thanking the members of the committee and the editor of the Bulletin, who had active charge of the campaign, for their kind assistance and indulgence, this report is respectfully submitted.

Statement of expenses December, 1909 to July 31, 1909 inclusive.

1908 December expenses	$48 32	Itemized as follows:	
1909 January expenses	50 00	Rent of Typewriter 7 months at $3 00	$21 00
1909 February expenses	77 00	Supplies	8 50
1909 March expenses	52 00	Stationery	24 60
1909 April expenses	45 00	Expressage on Blanks	2 50
1909 May expenses	66 05	Postage	109 42
1909 June expenses	49 65	The Stenographer Miss E. Baker 34 weeks at $8.00	272 00
1909 July expenses	50 00		
Total eight months	$438 02		$438 02

New Members elected from October 1908 to 1909.

Alabama	1
Arkansas	2
California	19
Los Angeles	5
San Francisco	4
Colorado	11
Denver	7
Connecticut	1
Delaware	0
D. C., Washington	3
Florida	3
Georgia	0
Idaho	3
Illinois	30
Chicago	22
Indiana	2
Indianapolis	0
Iowa	4
Kansas	2
Kentucky	4
Louisville	0
Louisiana	9
New Orleans	8
Maine	2
Maryland	6
Baltimore	5
Massachusetts	16
Boston	4
Michigan	11
Detroit	4
Minnesota	5
Minneapolis	1
St. Paul	3
Mississippi	1
Missouri	6
Kansas City	1
St. Louis	3
Montana	2
Nebraska	5
Omaha	1
Nevada	2
New Hampshire	0
New Jersey	7
New Mexico	1
New York	22
N. Y. City	13
Brooklyn	3
Buffalo	0
North Carolina	1
North Dakota	7
Ohio	10
Cincinnati	0
Cleveland	5
Columbus	0
Toledo	0
Oklahoma	10
Oregon	22
Portland	12
Pennsylvania	26
Philadelphia	9
Pittsburg	15
Rhode Island	5
Providence	3
South Carolina	1
South Dakota	2
Tennessee	2
Nashville	2
Memphis	0
Virginia	7
Richmond	1
Vermont	11
Washington	9
Seattle	7
West Virginia	1
Wisconsin	6
Milwaukee	3
Wyoming	0
Texas	13
San Antonio	2
Canada	1
Province of Quebec	1

New Members elected 1909. By States in order of numbers.

Illinois	30
Chicago	22
Pennsylvania	26
Pittsburg	15
Philadelphia	9
New York	26
N. Y. City	13
Oregon	22
Portland	12
California	19
San Francisco	5
Los Angeles	4
Massachusetts	16
Boston	4

Texas	13	Wisconsin	6
San Antonio	2	Milwaukee	3
Michigan	11	Minnesota	5
Detroit	4	St. Paul	3
Colorado	11	Minneapolis	1
Denver	7	Nebraska	5
Ohio	10	Omaha	1
Cleveland	5	Rhode Island	5
Oklahoma	10	Providence	3
Louisiana	9	Iowa	4
New Orleans	8	Kentucky	4
Washington	9	Louisville	0
Seattle	7		
North Dakota	7		
Virginia	7		
Maryland	6		
Baltimore	6		
Missouri	6		
St. Louis	3		
Kansas City	1		
New Jersey	6		

3: D. C. Washington, Florida, Idaho.

2: Arkansas, Indiana, Kansas, Maine, Montana, South Dakota, Tennessee, West Virginia, Vermont, Nevada.

1: Alabama, Arizona, Connecticut, Mississippi, New Mexico, North Carolina, Quebec.

None: Delaware, Georgia, New Hampshire, South Carolina, and Wyoming.

WM. B. DAY, *Chairman.*

On motion of Mr. Hallberg, seconded by Mr. Claus, the report just read was accepted and referred to the Council for consideration.

The report of the Committee on Weights and Measures, Edward Kremers, Chairman, was read by the Secretary:

REPORT OF COMMITTEE ON WEIGHTS AND MEASURES.

Immediately upon the appointment of this committee, its Chairman wrote to the other members asking for suggestions. None were received up to the present time.

When notified of his appointment as Chairman of this committee, the writer was informed by the President that he was expected to do something.

Like so many others, the author of this report has written about the metric system, but he learned early that merely writing about the improvement of our weights and measures brought about but little reform. The failure to receive suggestions, as well as the admonition of the President, therefore, merely strengthened your reporter in his belief that the best he could do under the circumstances was to keep on doing the work begun more than fifteen years ago.

A decade or more ago, a Wisconsin druggist happened to be a member of Congress from his district. Some time or other he was made Chairman of the Committee of Weights and Measures. His father, also a druggist, felt it incumbent upon himself to second this Congressman's labor in his own state. He wrote papers and asked others to write. Among those others your present reporter was asked to make a plea for the metric system. He did so in his own way. But why not advocate its use to others? For the simple reason that a much better propaganda could be made for the metric system than its mere advocacy.

In short, the story of your reporter's work in behalf of the metric system is this. Each pharmacy student, as he enters upon his work at the university is given a good set of metric weights retailing in this country at about $7.00. During the first semester he makes use of this act in the study of pharmaceutical technique, during the second semester in quantitative analysis. During the third and fourth semesters he uses the same

weights in all of his pharmaceutical chemistry, also in the drug assaying of the practical pharmacy work. Owing to the expense of having the weights restandardized, the sets are not taken back. The student can sell them if he so chooses, but most of the graduates take them into the drug stores in which they find positions as clerks. In this manner several hundred sets of good metric weights have been sent out to do missionary work in the drug stores of Wisconsin and elsewhere. This quiet missionary work is surely more effective than the reading of papers before our state associations or the reading of reports before the A Ph. A.

Should this brief recital induce others to do likewise, it may be worth recording in our proceedings.

Such action need not preclude other educational effects whenever they seem productive of good results even though those may seem remote. Thus it has been suggested by a member of the A. Ph. A. not a member of this committee that an educational chart of the metric system be exhibited in every post-office. While in the larger cities the educational value of such charts might be questioned, in our country communities they would, no doubt, be studied, especially if the exhibition of such a chart be accompanied by an official statement that after such and such a date postage on all mail parcels will be collected on weight as expressed in the metric system.

Such action would not only give to the metric system the widest possible use, but would also place us on the same footing with most European countries.

EDWARD KREMERS, *Chairman.*

Mr. Hallberg moved that the report be received, and that the request therein contained be referred to the Postmaster General of the United States. This motion was seconded by Mr. Caspari and carried.

The General Secretary read the report of the Committee on Status of Pharmacists in the United States Army and Navy and Public Health Service.

Mr. Payne, of Georgia, moved that the report be received, and Mr. Wilbert seconded the motion that the report be received.

The General Secretary asked for specific instructions as to whether the report should be published in the Proceedings, stating that in its present form it could not be published without directions to that effect. This brought forth an expression of view from several members, namely: Messrs. Wilbert, Asher, Hallberg, M. R. Mason, Meissner and Beal, with the final result that a motion by Mr. Beal, seconded by Mr. Claus and Mr. Meissner, to refer to the Council for consideration was adopted.

The report of the Committee on Parcels Post, H. D. Kniseley, Chairman, was called for as next in order, and the General Secretary stated that while the report had not yet reached his hands, it would no doubt arrive later by mail. The following is the full report.

REPORT OF THE COMMITTEE ON PARCELS POST.

To the President and Members of the A. Ph. A.:

Greeting: In submitting my report as Chairman of your Committee on Parcels Post, I do so realizing the importance of the work we have had intrusted to our care, and with a further knowledge that all the members of the A. Ph. A., as well as many of the members of the different State Associations, are not unanimous in their opinions as to what we should have in the way of Parcels Post legislation.

We have had no response from many who should have taken an interest in such legislation, and we have had many expressions such as these, "We want Congress to pass the Parcels Post Bill;" "It offers to us more than we run any chance of losing;" "It will be of great advantage to me if we get rural free delivery, so much so that I cannot oppose the measure as now introduced in Congress."

The above expressions show us that at least a part of our membership are doing all they can in securing the passage of the Parcels Post Bill. With these discouraging communications we went to work earnestly to secure all the assistance we could, and through the combined agencies of those forces opposed to Parcels Post legislation our enemies were defeated, and we now pass the question up to the next committee, who we suppose will be named by Dr. Rusby, and let them combat the question in the next session of Congress.

Our President, Prof. Oscar Oldberg, appointed your committee early in the last session of Congress, and we were thus enabled to get our requests and recommendations before the Committee on Postoffice and Post Roads before they had really begun consideration of this part of their work.

The Chairman desires to say he had a very strong and personal friend in Washington who was private secretary to one of our Congressmen, and that through him we had much more influence than we could have had in any other way, and through him we have been informed from time to time when our question was under consideration. We have also had a friend in the person of one of the Oklahoma Senators, who was also a member of the Postal Roads Committee.

At the outset when we began our work it was necessary to secure competent service at Washington, which was donated to us, excepting a small fee for postage and stenographer, which amounted to $5.50, which was paid by the chairman of your committee. I am not informed as to the amount, if any, expended by my colleagues, but in addition to the $5.50 above referred to the chairman has had an office expense of stationery, postage and stenographer amounting to a sum of $11.90, for which we will ask the Association to reimburse us.

Before accepting the chairmanship of this committee I wrote our President that I could not serve without an appropriation being made with which to meet these expenses, from the fact that I had served the previous year, bearing all my own expenses, and as my time was all taken up, I would be compelled to have the work done instead of doing it myself.

At the organization of Congress, as soon as the committees were appointed, we mailed a list of the honorable gentlemen to a number of the prominent pharmacists of the United States, asking them to address their Senators and Representatives requesting them to make the subject of parcels-post legislation an item of special interest and insisting upon them helping us out of our troubles. A copy of this letter was published in the "Bulletin."

Because of the fact that our membership is divided—some for, others against—the parcels post, I shall refrain from making the recommendations I otherwise would make as a basis for next year's work.

As I have expressed in previous reports, I am against all schemes and propositions of the mail-order houses to advance their own interests when such special privileges are detrimental to the retail merchants throughout the country. Let the mail-order large catalogue houses subject their goods to the same freight and express rates that the retail merchant has to pay, and let our merchants have a living chance who pay insurance, rent and taxes, who build the roads and churches, and support the schools and other eleemosynary institutions, which contribute so much to this great commonwealth of ours.

Wishing the A. Ph. A. a pleasant and profitable meeting, and regretting my inability to meet with you in Los Angeles, I am,

Yours fraternally, H. D. KNISELEY, *Chairman.*

The report of the Committee on Patents and Trade-Marks was called for, but Mr. Meissner, of that committee, stated that the report was a long one, and he thought it would be well to defer it to Friday's general session, to the end that it might have fuller consideration. This was agreed to.

As to the report of the Committee on Drug Reform, C. Lewis Diehl, Chairman, the Secretary announced that the report had not reached him. Mr. Hallberg, of the committee, said he had written the Chairman about it, but had gotten no response, and he did not know whether there would be a report or not. Mr. Diehl himself was not present at the meeting.

The report of the Committee on Drug Market, E. L. Patch, Chairman, was called for, and the Secretary stated that the Association had heretofore received quite a long report from this committee, but that he had received none at all this year. Mr. Wilbert stated that the report had come with the papers of Mr. Vanderkleed, Chairman of the Scientific Section, and moved that the report be received and referred to the Committee on Scientific Papers for consideration in that Section. This motion was seconded by Mr. Beal and carried.

The report of the Committee on National Formulary was called for, and Mr. Wilbert, of that committee, stated that he had the report, a very comprehensive one, covering some forty-seven closely printed pages, which he would be glad to read to the Association if the members desired it. He added, however, that it was usual to refer the report to the Section on Practical Pharmacy. The Chair stated that without objection, it would be so referred, and it was so ordered.

The report of the Committee on Non-Official Drugs and Chemical Products was next in order, and Mr. J. H. Beal stated that that report was now under consideration by the Council, and he presumed it would be referred to the Association at the next general session. With this understanding, the matter was passed for the time being.

The report of Delegates to the Section on Pharmacology of the American Medical Association was called for, and the Secretary said he had that report. Mr. Wilbert, of the committee, said the report was one on the proceedings of the section, and contained no suggestion or recommendation, as he recalled; that it was simply a report of the delegates. He therefore moved that it be received, to take the usual course, and this motion was seconded by Mr. Cohn and carried. The text of the report here follows:

THE REPORT OF THE DELEGATES TO THE SECTION ON PHARMACOLOGY AND THERAPEUTICS OF THE AMERICAN MEDICAL ASSOCIATION.

To the Members of the American Pharmaceutical Association.

The sixtieth annual meeting of the American Medical Association held in Atlantic City, N. J., June 8–11, 1909, was a notable occurrence not only from the point of attendance, but especially from the amount of work accomplished, the character of papers

presented and the discussions engaged in, and the marked advance in the scientific progress of medicine indicated.

The Section on Pharmacology and Therapeutics was presided over by our fellow-member Dr. Reid Hunt, and the presence of a number of pharmacists at these meetings was noticeable. The delegates of the American Pharmaceutical Association were welcomed and accorded a place on the program. In presenting the cordial, fraternal greetings of this Association to the A. M. A. the chairman took occasion to pres nt and seek the co-operation of the American Medical Association to three distinct propositions that were under consideration at our Hot Springs meeting.

The first of these was the resolution adopted (see Proceedings 1908, folio 531) soliciting the co-operation of the American Chemical Society and the American Medical Association to the universal adoption of and adherence to the pharmacopœial spelling and nomenclature as the official and legal standards for such. 2d. The desire to have the interest, advice, co-operation and assistance of the medical profession in the revision of the National Formulary. 3d. The opportunity afforded by the work of the Council on Pharmacy and Chemistry on New and Non-Official Remedies and of the Committee on Non-Official Drugs and Chemical Products of the A. Ph. A. for co-operation. It was suggested that the joint preparation of monographs on many of the articles, which would necessarily have to be considered by both committees, would establish standards for such having the approval of both associations, and these would assume an authoritative position and command the adherence of both medicine and pharmacy.

At a subsequent meeting the incoming Chairman of this Section was requested to appoint a committee of five on the National Formulary. The other two propositions were not acted upon.

The question of restricting the sale of potent and habit-forming drugs was referred to the Executive Committee who are expected at the next annual meeting to report a feasible method for the control of the traffic in habit-forming drugs.

The increased interest of the membership of the A. M. A. in matters relating to the U. S. Pharmacopœia was evidenced by the titles of a number of the papers and the actions and discussions of a number of the Sections. Dr. Reid Hunt in his address as Chairman of the Section on Pharmacology and Therapeutics discussed some of the evident needs in connection with the coming revision of the U. S. Pharmacopœia and the duties of the physicians in connection therewith. The National Pharmacopœia was likewise a topic of reports of special committees in the Sections on Practice of Medicine, Stomatology, Opothalmology and Dermatology.

The papers and discussions presented before the Section on Pharmacology and Therapeutics showed a growing closer relation between medicine and pharmacy, as the program contained an unusual number of titles of interest to both professions. Among the papers of interest may be noted "The Determination of the Quality of Ergot" by Dr. H. C. Wood, Jr., "Some Observations on the Pharmacologic Action of Ergot" by Drs. E. M. Houghton and H. S. Yutema. An interesting feature of the program was a symposium on "Dietetics" covering the use of ferments in medicine and the use of proprietary foods and etc. Another symposium arranged, was upon the subject of "Serum and Vaccine Therapy" represented by a number of papers.

The program for both sessions of Thursday was specially devoted to the discussion of problems relating to the U. S. Pharmacopœia and N. F. and consisted largely of papers prepared by pharmacists. Among those contributing to this portion of the discussion were Prof. C. S. N. Hallberg, Dr. L. F. Kebler and Dr. Henry Leffman.

An interesting and instructive exhibition was arranged on one of the large ocean piers. In addition to the usual commercial exhibits of books, instruments, medicaments, dietetic foods and other commodities, a large section was devoted to the scientific and educational exhibit. A notable feature of this was the excellent presentations of the effect of

tuberculosis and the methods pursued for combating the "white plague." Innumerable pathological specimens were shown by several of the larger hospitals and medical schools. Radiology and its application to diagnosis was well illustrated by several hundred radiograph plates.

The Philadelphia Branch of the A. Ph. A. made an exhibit of official drugs, drug plants and preparations. A pamphlet entitled "The Prescription—a few suggestions as to the method of ordering elegant extemporaneous pharmaceuticals"—prepared by the committee in charge was distributed to the visiting physicians. This was an effective method of carrying on the propaganda for the U. S. P. and N. F. remedies. This exhibit was awarded "a diploma of merit for exhibits of especial merit." In connection with their exhibit the Philadelphia Branch arranged for a special meeting on Friday, with a program replete with papers on U. S. P. and N. F. and N. N. R. topics, and the visiting physicians and pharmacists and the members of the Eastern Branches of the A. Ph. A. were all invited to participate. The discussions, although at times quite spirited, brought out many good points and demonstrated the value of such joint meetings.

Respectfully submitted, GEORGE M. BERINGER, *Chairman.*

Mr. H. B. Mason presented for Chairman Hynson the report of Delegates to the National Association of Retail Druggists as follows:

REPORT OF DELEGATES TO NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

To the Officers and Members of the American Pharmaceutical Association.

Ladies and Gentlemen: Your delegates to our sister organization, the National Association of Retail Druggists, during its annual meeting at Atlantic City, N. J., September 14–18, 1908, beg leave to acknowledge the great honor and pleasure we enjoyed in thus representing you and this revered Association. We are pleased to report a most complimentary and cordial reception to your delegation by the officers and members of the National Association of Retail Druggists. This exhibition of fraternalism, the prominence given to the reception of this delegation on the meeting's program and the actual voting power accorded it by the constitution of the N. A. R. D., plainly shows the confidence and respectful feeling it holds for this organization.

After extending the greetings of this Association, which were kindly received, in presenting the resolutions adopted at Hot Springs, Arkansas, bearing date of September 11, 1908, published on page 516, Vol. 56 of the Proceedings, we ventured to express ourselves, in part, as follows:

"The National Association of Retail Druggists presents push and vigor and youth, coupled with the science of commerce and the philosophy of trading. The American Pharmaceutical Association presents age, conservatism and strength, coupled with professionalism and the art and science of pharmacy. There can be no possibility of a clash between these two organizations. Each should maintain its independent organization, but both should work in unison for the same exalted end. They should closely coöperate and make such concessions and such sacrifices as will, with the individual effort of each, bring about the best and the most wholesome benefits to this great profession of ours."

No doubt, you will be interested in knowing that much, very much, of the more important work of the N. A. R. D. is along exactly the same lines as that undertaken by this Association. We believe this fact should be constantly borne in mind by our members and should lead to more helpful coöperation between the two associations.

By carefully prepared committee reports and by seriously enacted resolutions it is abundantly shown that the N. A. R. D. is making effort to effect and improve legisla-

tion, touching general pharmaceutical practice, uniformity in pharmacy laws, more active policing, itinerant vending, the standing of the Government's pharmacists, patent laws, state and interstate narcotic laws, a national department of public health, and the sale of liquor by pharmacists. In much the same manner it encourages and demands better preliminary education for pharmacists and higher attainments for those who would enter pharmaceutical practice. It seeks to secure the better moral standing of pharmacists, and, to this end, adopted the following:

"PHARMACEUTICAL CODE OF ETHICS."

"*Resolved*, That the N. A. R. D. in convention assembled places itself upon record as being strongly opposed to its members lending their influence toward promoting the indiscriminate use of patent medicines by the laity.

"As strongly urging its members not to indulge in the practice of counter-prescribing.

"As advising its members to abstain from selling habit-forming drugs except upon prescriptions written by reputable, licensed medical practitioners.

"As strongly deprecating the practice, reported to exist in some sections of the country, of druggists paying commissions on prescriptions to doctors.

"As denouncing the exploitation of official remedies under fanciful names and at extravagant prices, through collusion between pharmaceutical manufacturers and a few medical beneficiaries.

"As emphatically denouncing the practice indulged in by certain pharmaceutical specialty houses of giving free shares of stock to doctors who order their specialties.

"As deprecating the abuse of free medical dispensary privileges, so common in the hospitals of to-day. The indiscriminate charity, extended to rich and poor alike, has a pauperizing tendency and deprives the retail druggist of his rights and privileges through an agency that by taxation he is compelled to support.

"As denouncing the encouragement given doctors to dispense tablets by pharmaceutical manufacturers, who pretend to cater to the wants of the retail druggists."

Especially active were the sessions whereat were discussed the United States Pharmacopœia, the National Formulary, and the so-called "propaganda" of these. In this connection your delegates offered the following:

"WHEREAS, The greater use in medicinal practice of standard, open formula, ethical preparations and the consequent less use and possible final elimination of proprietary, secret, non-standard products is a matter of vital concern to the profession of medicine as well as to professional and commercial pharmacy, and,

"*Whereas*, The general welfare and professional standing of pharmacy and pharmacists is intimately involved in the U. S. P. and N. F. propaganda, therefore be it

"*Resolved*, That the National Association of Retail Druggists, in convention assembled, suggests and favors the formation of a Commission composed of three representatives from the American Medical Association, three members from the American Pharmaceutical Association and three members from the National Association of Retail Druggists, to which shall be referred matters connected with the said propaganda, and which Commission shall devise and set forth plans for the promotion of this work for all bodies and individuals, and plans for providing the means necessary to carry it on successfully. This Commission shall report its findings to the several organizations which it represents for confirmation and acceptance by the executive bodies of the three associations."

This was referred to the Committee on Resolutions, was reported, slightly modified and adopted by the Association as follows:

"*Resolved*, That a committee of three be appointed to act in connection with a similar committee to be appointed by the American Pharmaceutical Association and the American Medical Association to act on matters pertaining to U. S. P. and N. F. propaganda

work for the purpose of formulating a national plan of campaign in the said work, said committee to report at our next annual meeting."

To this particular suggestion of ours, regarding this important and much-discussed subject, we call your especial attention, and beg for it your thoughtful consideration and careful treatment. We believe it offers the proper and most promising plan yet presented for promoting the use of preparations of the two national standards.

We feel that we would be unmindful of this Association's special interests if we failed to call your attention to several other resolutions adopted by the N. A. R. D. They are as follows:

"*Resolved*, That the various State and Local Associations are advised to introduce bills into their several Legislatures providing for the enactment of laws requiring that every pharmacy be supplied with a copy of the last edition of the United States Pharmacopœia and the National Formulary."

"*Resolved*, That we are gratified to learn on very good authority of the intention of the American Pharmaceutical Association to immediately proceed with the revision of the National Formulary. We congratulate the pharmacists of the country on the prospect of having placed in their hands within the next two years a new and enlarged edition of this important and valuable standard work."

"We are pleased to be able to say to the pharmacists of the country that the Revision Committee of the American Pharmaceutical Association will not only be glad, but urges the druggists of the country to assist them by criticism and suggestion in the work entrusted to their hands. They will gladly consider the introduction into the pages of the New Formulary, such additional preparations for which there may be a demand, the formula of which can be improved."

"Resolved, that the Trustees of the Pharmacopœial Convention be requested to instruct the Revision Committee of the United States Pharmacopœia to make such changes in the Pharmacopœia as experience has proved are necessary, without delay."

Believing that a large majority of our Association's members favor more closely connected meetings of the two associations, we did all we could to bring these about. From all we could learn, closely following meetings, at some convenient point, were favored by a large majority of the attending N. A. R. D. delegates, but as the accomplishment of this proposal was left to a joint special committee, we feel our responsibilities ended with the convention.

Although, as stated, we were tendered the right to vote, we deemed it discreet to uniformly refrain from exercising that privilege, which non-action, we trust, has your approval.

Respectfully submitted,

H. P. HYNSON, *Chairman*,
HARRY B. MASON,
W. L. CLIFFE.

The Chair called for action on the report just read, and Mr. Wilbert moved to receive and refer to the Publication Committee. This motion was seconded by Mr. Beal and carried.

The report for Delegates for the National Wholesale Druggists' Association was read by the General Secretary:

REPORT OF THE DELEGATES TO THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

To the Members of the American Pharmaceutical Association:

The thirty-fourth annual meeting of the National Wholesale Druggists' Association was held at the Marlborough-Blenheim Hotel, Atlantic City, N. J., September 22nd to

25th last. It was the privilege of three members of this delegation to attend at least some of the meetings and we were cordially welcomed. In presenting the greeting of the American Pharmaceutical Association, the Chairman took occasion to point out the growing community of interest between the two associations and the sentiments of mutual good will and respect were heartily reciprocated.

The work of the N. W. D. A. is accomplished very largely through committees and the reports submitted were very instructive and showed very decided progress accomplished along many lines. Fire Insurance, Adulteration, Drug Market, Credits and Coöperative Buying Clubs were some of the topics treated.

The Committee on Proprietary Goods, were congratulated on securing a greatly extended list of manufacturers who had increased their wholesale discounts to not less than 10 and 5 per cent.

Legislation occupied an important position in the discussions. Recent Trade Mark Legislation was detailed and recent Food and Drug Legislation and Anti-Narcotic laws reported. Modification of the Sherman Anti-Trust Law was advocated and likewise the repeal of the law of 1848 relating to imported drugs. The proposed Parcels-post was opposed and a Postal Saving Bank was approved. Legislation was favored providing for a refund of the internal revenue tax paid on domestic alcohol forming a component part of exported articles.

From a pharmacist's view-point, one of the most encouraging signs was the increased interest shown in the United States Pharmacopœia and the fixing of standards for unofficial drug commodities. The Association is urgent in its request that "in the next Committee on Revision of the U. S. Pharmacopœia there should be added several chemists of large experience in manufacturing and one or more druggists who are thoroughly familiar with the drug markets of the world." In the address by Professor Joseph P. Remington, a proposition was presented that the N. W. D. A. establish a Pharmacopœial Research Laboratory. This was referred to a committee for consideration.

Mr. Fred L. Carter of Boston was elected President and Richmond was selected for the place of meeting in 1909.

Respectfully submitted,

GEORGE M. BERINGER, *Chairman.*
CASWELL A. MAYO.

CAMDEN, N. J., *July 19, 1909.*

Mr. Wilbert moved that the report just read be received and referred for publication, and Mr. Ladish seconded this motion. Carried.

The Chair stated that the time had now come for the report of the Committee on the President's Address, William M. Searby, Chairman. Mr. Wilbert stated that he had acted as Secretary of the committee, and would read the report:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee appointed to consider the recommendations embodied in the Address of the President of the Fifty-seventh Annual Meeting of the American Pharmaceutical Association has reviewed the several recommendations and agrees that the address contains a number of suggestions that, if carried out, could be made to redound to the advantage of the Association by increasing the number of members and by enlarging on the value of membership in this Association.

A number of these suggestions involve the fundamental laws of the organization, others will necessitate radical changes in the method of conducting our meetings, while still others involve changes in our Constitution and By-laws that should be carefully con-

sidered by an appreciable number of members of our Association before definite action is taken. All these several questions, your committee believes, should be considered by a special committee appointed by the Council and by the Council itself before being presented for ratification by the membership at large.

Your committee also believes that it would be well if the portions of this address relating to changes in Constitution and By-laws were brought to the attention of the Committee on Reorganization and that this committee arrange for a joint session with the Council of this Association at the time of the next annual meeting to consider the practicability of making the changes in Constitution and By-laws at that time.

In addition to these several comprehensive and valuable suggestions your committee believes that the Address of the President contains a number of expressions of opinion, that, if not challenged may and probably will be construed as voicing the sentiment of this Association.

The assertion that the quack-nostrum evil "exists nowhere except in this country" is hardly borne out by the publications made by competent observers abroad. The nostrum traffic is an evil that should be considered by pharmacists and should, as rapidly as possible, be eliminated from the practice of true pharmacy. This traffic is, however, not a local condition, but one prevailing universally in all countries of the civilized world, and one that is deserving of careful study and continued attack.

Your committee heartily concurs in the assertion that the public can have no proper appreciation of the importance and dignity of pharmacy in the face of the mongrel character of the business done in some of our intensely commercial drug stores, and recommends that individual pharmacists seriously consider the advisability of curtailing their business to side lines requiring expert knowledge and superior skill.

The practice of true pharmacy involves obligations to the community at large that necessitate constant watchfulness and care, involve the regular testing of the medicaments that are dispensed on physicians' prescriptions, and necessitate infinitely more skill than is required to follow the directions for making any one of the many galenical preparations included in our national standards.

The true pharmacist, the man who is desirous of fully living up to his responsibilities to the community at large, finds that he can more readily assure himself of the identity, purity and strength of his preparations by making them himself than by attempting to apply the complicated tests that would be required to identify the nature and strength of preparations bought in the open market.

The percolation of drugs for the extraction of their soluble constituents is a process of which American Pharmacists may well feel proud, while originated in France it has been perfected in this country, has been in continuous use for upwards of half a century and is to-day being introduced more and more generally in all of the Pharmacopœias of the civilized world.

We firmly disagree with the President's opinion that Congress made any mistake in adopting the National Formulary as a legal standard. While no one will assert that the National Formulary is a perfected book, your Committee believes that there exists, as yet, a need for an authoritative compilation of formulæ for polypharmacal preparations and that the wide spread use, and the present day popularity of many of the preparations included in the National Formulary evidences the need for the continuance of this work as a standard under the provisions of the Federal and State laws designed to restrict the sale of inferior medicines.

While it is true that the National Formulary has been criticised we should not lose sight of the fact that criticism is an evidence of interest in the object criticised and that taken as a whole, the criticism that has been offered is constructive in character and does not justify the assertion that official recognition of this work "was a ridiculous mistake."

The opinion expressed that upon matters of national policy our members are sure to be divided is, of course, a just one, but this can in no way militate against the right of any appreciable number of members, who may be present at any one meeting, to express their views and to object to prospective legislation that they may think inimical to their particular occupation.

The Section on Commercial Interests of this Association has repeatedly placed itself on record as being opposed to the introduction of parcels post until such time as the Post-Office Department of this country has been placed on a paying basis, and the first class postage reduced to one cent an ounce.

Your committee believes that the majority of this Association should have the privilege to continue giving expression to their opinions on matters relating either to their trade or their profession.

Your committee believes that the expression of opinion regarding the activities of the Committee on the Status of Pharmacists in the Service of the United States Government is a timely one, and that the efforts of this committee should be directed primarily to the elevation of the ability and worth of government-service pharmacists rather than the increase of pay and rank.

Your committee would therefore recommend:

1. That the address of the President, in compliance with an expressed wish, be referred to the Council of this Association for further consideration.

2. That that portion of the address which refers to changes in Constitution and By-Laws be also referred to the Committee on Reorganization.

3. That members of this Association should continue to have the right to give expression to opinions on matters relating to their trade or profession.

4. That expressions of opinion in the President's Address relating to details in procedure or methods of making pharmaceutical preparations should in no way be considered as being representative of the opinions of all of the members of this Association; and,

5. That such of the members of this Association as differ from the opinions of the President regarding the value and uses of the National Formulary express their continued belief that the inclusion of the National Formulary in the provisions of the Food and Drugs Act of June 30, 1906, is fully justified by the results already attained, and that the National Formulary is admirably designed to meet the still existing need for polypharmacal preparations.

In conclusion, your committee would reiterate the assertion made in the introductory portion of this report: that the specific recommendations that are embodied in the address of the President are valuable and deserving of careful consideration on the part of members of this Association.

The committee would also insist that the individual opinions that are endorsed or criticized in this report should in no way militate or reflect on the value of these recommendations; and, therefore, recommends that a special vote of thanks be extended to President Oldberg for the many suggestions contained in his annual address.

Signed, W. M. Searby,
M. I. Wilbert,
C. S. N. Hallberg.

Mr. Meissner moved the adoption of the report on President's Address as read, this motion was seconded by Mr. Hallberg and carried.

The Secretary communicated an invitation from the pharmacists of Portland, Oregon, to the returning members of the American Pharmaceutical Association to stop off at Portland on their homeward journey, and be the recipients of their entertainment and hospitality. Mr. Hall-

berg gave notice of a trip to the Yosemite Valley, which Mr. Whelpley, of St. Louis, was arranging, and invited members who desired to take that trip to communicate with Mr. Whelpley.

The Secretary called attention to the fact that the official book of registration for the members of the Association was in the hands of the Local Secretary, at the Hotel Alexandria, and asked all the members who had not already done so to register, so that the Association might have an official record of those present at this meeting.

There being no further business before the Association at this time, the Chair declared an adjournment to Friday afternoon at 2 : 30 o'clock.

THIRD SESSION—TUESDAY AFTERNOON, AUGUST 17, 1909.

No business was transacted by the Association previous to the first session of the Section on Commercial Interests.

FOURTH SESSION—TUESDAY EVENING, AUGUST 17, 1909.

No business was transacted previous to the second session of the Section on Commercial Interests.

FIFTH SESSION—WEDNESDAY MORNING, AUGUST 18, 1909.

No business was transacted previous to the first session of the Section on Education and Legislation.

SIXTH SESSION—WEDNESDAY AFTERNOON, AUGUST 18, 1909.

No business was transacted previous to the second session of the Section on Education and Legislation.

SEVENTH SESSION—WEDNESDAY EVENING, AUGUST 18, 1909.

No business was transacted previous to the third session of the Section on Education and Legislation.

EIGHTH SESSION—THURSDAY MORNING, AUGUST 19, 1909.

No business was transacted previous to the first session of the Section on Scientific Papers.

NINTH SESSION—THURSDAY AFTERNOON, AUGUST 19, 1909.

No business was transacted previous to the first session of the Section on Practical Pharmacy and Dispensing.

TENTH SESSION—THURSDAY EVENING, AUGUST 19, 1909.

No business was transacted previous to the second session of the Section on Scientific Papers, and the second session of the Section on Practical Pharmacy and Dispensing.

ELEVENTH SESSION—FRIDAY MORNING, AUGUST 20, 1909.

No business was transacted previous to the session of the Section on Historical Pharmacy.

TWELFTH SESSION—FRIDAY AFTERNOON, AUGUST 20, 1909.

The twelfth (and final) general session of the Association was called to order by First Vice-President Eberle at 2 : 45 p. m., and the Chair called on the Secretary to read the minutes of the second session, held on Tuesday morning, which he did. On motion of Mr. Claus, seconded by Mr. Ladish, the minutes were adopted as read.

The Chair called on the Seeretary of the Council to read the minutes of that body since the last session, and Mr. England read the minutes of the fourth session, held Wednesday morning, August 18, 1909, as follows:

MINUTES OF THE FOURTH SESSION OF THE COUNCIL.

The fourth meeting of the Council was held on August 18, 1909, 9 : 30 a. m., Chairman Remington presided.

The minutes of the previous meeting were read and approved.

Members present, Remington, Godbold, Asher, Claus, Caspari, La Pierre, Eberle, Koch, Seltzer, Whelpley, Beal, Hallberg, Bond, Wilbert, England and Mason.

The Secretary of the Council being obliged to leave to attend the meeting of the Section on Education and Legislation, Mr. Wilbert was appointed as Secretary pro tem.

A communication from President Oldberg bearing on the reimbursement of Mr. Beringer for expense incurred in the defense of a suit at law disscussed in the Druggists' Circular for August, 1909 (p. 392) was presented. It read as follows:

CHICAGO, *August 9th, 1909.*

To the Council of the American Pharmaceutical Association—
JOSEPH P. REMINGTON, *Chairman.*

Permit me to lay before you a few questions which were not touched upon in my annual address:

1. Enclosed herewith is a page from "The Druggists' Circular" discussing editorially the loss to which Mr. Geo. M. Beringer was subjected by the suit brought against him for damages, which suit grew out of a paper read before our Association. I wish to say in this connection that I purposely omitted this matter from my address, but deem it my duty to request the Council to carefully consider it, with the view to make whatever reparation can be made to Mr. Beringer. The case speaks for itself.

2. I am informed that the American Medical Association at its annual meeting this year passed a resolution condemning the use of sodium benzoate as a preservative in food products, on the ground that the substance itself is injurious to health and that it is employed to restore decomposed food material. I am also informed that an effort may be made to procure an endorsement of these views by the American Pharmaceutical Association.

In view of the position taken by the Commission of Chemists appointed by President Roosevelt to pass upon this question, it seems to me that our Association should *not* put itself upon record as declaring that sodium benzoate in the quantities in which it is employed as a food preservative is injurious to health. As pharmacists, we have no data of our own upon which to base an independent decision, such matters are not properly passed upon except by expert specialists, and the American Medical Association does not need, and might properly resent, our endorsement, on the ground that we are not competent to decide.

As for the declaration that sodium benzoate is employed to restore decomposed material, it seems impossible that the substance can have any such effect.

In view of these considerations, the American Pharmaceutical Association should decline to take any action whatever in this matter.

3. The report of the Committee on Patents and Trade-Marks contains reference to a decision rendered by a court of record in a suit involving the exclusive right to the use of a name and of a product. It is a far-reaching decision and, if not reversed, solves the question of monopoly in medicinal products in the only right way. The conclusion reached by the committee should be reaffirmed by our Association, notwithstanding the fact that it conflicts with the conclusion reached by the American Medical Association on the advice of an attorney making a specialty of patents and trade-marks, if I am correctly informed.

4. Chapter III of the By-Laws of the Council provides that the annual salary of the Secretary of the Council shall be $300. I cannot find that the Secretary has drawn this salary for several years.

I recommend that payment of this salary be resumed. The Secretary of the Council is a busy man, and his duties have increased very much of late, and will increase more rapidly as the number of local branches grows.

5. I recommend that the next volume of our Proceedings be made to contain complete statements of our several trust funds, how they originated, their purpose and their respective amounts. Also clear statements of the terms upon which prizes are awarded, as, for example, the Ebert prize. In this connection I would recommend that when the trustees of the Ebert estate make their final report as executors, and turn over the proceeds to our treasurer, they be instructed to sell the jewelry in one lot to the highest bidder for the same. This can be done most conveniently in Chicago. The jewelry should not be sold piecemeal.

I regret exceedingly my inability to be with you at Los Angeles. My physician decides that I cannot without danger undertake so strenuous a journey until after two months more of rest at home.

Yours with affectionate regard, OSCAR OLDBERG, *President.*

Prof. Rusby addressed the Council on the question of reimbursing Mr. Beringer.

A communication from Mr. Cliffe, bearing on the same question, was read, as follows:

August 4, 1908.

PROFESSOR J. P. REMINGTON, *Chairman of Council, A. Ph. A.*

Dear Sir: As an officer of the Association I hope you will call the attention of the Council to the advisibility of furthering some form of relief for Mr. Beringer in the matter of the suit defended by him and brought by the Farben Fabriken Co. in the U. S. Court at Trenton, N. J.

I understand that the amount expended by Mr. Beringer was about twelve hundred dollars, and I know that you will agree with me that this is a pretty heavy price to pay for the privilege of talking freely in meeting.

While I fully appreciate the fact that the Association has no funds available for the purpose and that the Council could not appropriate anything for the purpose, and would naturally hesitate to recommend that the Association should make an appropriation for this object on account of establishing a precedent; still I am of the belief that your Council could properly and should under the circumstances existing, recommend to the Association the establishment of a subscription fund among its members for the purpose of relieving Mr. Beringer of a portion, at least, of the amount expended in his defense.

I have not had any conversation with Mr. Beringer in regard to this and he has never intimated to me that such action ought to be taken, but I have frequently heard men with a knowledge of the facts say that something should be done for his relief.

Regretting that the present condition of help and business prevent my presence at the meeting, I remain,

Very truly yours, W. L. CLIFFE.

Discussed by Messrs. Rusby, Wilbert, Hallberg, Bond, Mason, Caspari, Whelpley, Beal, Remington.

Mr. Rusby urged immediate action.

Mr. Hallberg moved, seconded by Mr. Caspari, that a committee of three be appointed to consider the question, confer with Mr. Beringer, and report to this Council a resolution on the attitude of Mr. Beringer, and the best method of reimbursing him.

The first portion of paragraph 5 of President Oldberg's communication was endorsed. (Synopsis to be published in Resolution.)

Members were elected on applications from Nos. 364–370 inclusive.

Moved by H. M. Whelpley and seconded by J. H. Beal that the Committee on Publication be instructed to publish annually in the Proceedings a synopsis of the proceedings of the A. C. P. F. and the N. A. B. of P., the synopsis to be furnished by these organizations.

Report of the General Membership Committee was presented. It was read in full and then discussed by Messrs. Hallberg, Searby and Whelpley.

On motion it was agreed that the appropriation requested, $60.00 per month for ten months, be allowed for membership campaign.

The report of the Committee on the Status of Pharmacists in the Government Service, of the A. Ph. A. was presented, and referred to a committee consisting of Messrs. Searby, Whelpley and Wilbert.

It was decided to make the report of the Committee on Standards special business for August 19, 1909, at 9 a. m.

Mr. Beal moved the nomination of Enno Sander as Honorary President of the American Pharmaceutical Association, seconded by Mr. Whelpley.

On motion, Mr. Sander was unanimously elected.

A committee was appointed to draw up suitable resolutions regarding the death of Thomas S. Wiegand, and the General Secretary was instructed to insert the portrait of Mr. Wiegand in the next volume of Proceedings.

On motion, the Chairman of the Council was instructed to send fraternal greetings to Messrs. Dohme, Sheppard and Diehl.

Adjourned to meet August 19, 1909, at 9 a. m.

M. I. WILBERT, *Secretary pro tem. of the Council.*

The Chair called for action on the minutes of the Counsel as read, and Mr. Hallberg, seconded by Mr. Wilbert, moved that they be approved as read. This motion was adopted.

Secretary England, of the Council, read the minutes of the fifth session of that body, held on Thursday morning, August 19th:

MINUTES OF THE FIFTH SESSION OF THE COUNCIL.

The fifth meeting of the Council for 1908–09 was held August 19, 1909, 9:30 a. m., Chairman Remington presiding.

Present: Messrs. Remington, Godbold, Asher, Claus, Caspari, LaPierre, Searby, Eberle, Koch, Whelpley, Beal, Hallberg, Bond, England and Mason.

The following committee on the Beringer Question was named: Messrs. Wilbert, Rusby, and Whelpley.

A committee of one on Memorial Resolutions upon the late Thomas S. Wiegand of Philadelphia was named,—J. P. Remington.

The report of the Committee on Standards for Non-official Drugs and Chemical Products was considered as special order of business.

J. A. Koch presented the following report:

REPORT OF THE COMMITTEE ON STANDARDS FOR NON-OFFICIAL DRUGS AND CHEMICAL PRODUCTS.

To the Council of the American Pharmaceutical Association:

The resolutions adopted at the last annual meeting authorized the appointment of this committee and instructed our consideration of two propositions. First, "To prepare from existing sources of information a tentative list, subject to revision, correction and extension by the Association, of the principal drugs, chemicals and medicinal preparations not recognized by the United States Pharmacopœia with a suitable system of nomenclature for the same, and to adopt suitable limits of strength and purity therefor."

Second, "At the next annual meeting of the Council, they shall report upon a plan for the permanent organization of the committee, also upon a plan for the permanent continuance of the work."

Owing to the delay in the selection of a chairman, the work of the committee was not taken up until a considerable portion of the year had elapsed. The members of the committee were widely scattered and all discussions and interchange of views had to be carried on, almost entirely, by correspondence which was necessarily slow and introduced the inevitable misunderstandings which are more readily avoided in a meeting. It was apparent that some of the members of the committee who had not heard the discussion at Hot Springs, when the subject was under consideration, had but a vague understanding of the resolutions adopted and what it was hoped to accomplish through the labors of such a committee. However, as the result of voluminous correspondence, we have adopted certain resolutions and motions which are embodied in this report and outline a plan for a permanent committee and the continuance of this work if the Council so decides.

Tentative List.—The preliminary lists herewith submitted have been compiled by subcommittees very largely from the dismissals from the U. S. P. since the revision of 1870,

to which have been added such other products as are more or less commonly sold by druggists and quoted on the price-lists of chemical manufacturers, importers and jobbers. It is fully realized that they are incomplete and imperfect and in some respects the classifications are not sharply drawn. Yet they will serve as provisional lists to illustrate how voluminous and varied are the non-official products that enter into drug stocks and trade transactions, and the enormity of the task that will be assigned to a standing Committee on Standards for Non-Official Drugs and Chemical Products, if the Council decides to continue it and instruct procedure along the lines contemplated.

The Committee do not submit standards or definitions for any of these items at present, nor do they recommend that standards be fixed for *all* of the articles named. These lists serve to show only a portion of the items that are available for definition and standardization and they are submitted for the consideration and action of the Association in accordance with the instructions.

There are two points in connection with the scope of the work to be undertaken, upon which the Council should clearly define the intent of the resolutions under which we are acting.

First. In the resolutions the words "medicinal preparations" are used. Is it the intent to include formulas for such unofficial galenical preparations as are called for? This is a question of some importance as its decision will very materially influence the work and the character of the publication resulting from the labors of such a committee. The tentative list of pharmaceutical preparations submitted, consists almost entirely of dismissals from the U. S. P. that have not been included in the N. F. It is not by any means indicative of the list that can be prepared if the foreign pharmacopœias and formularies and the current literature, such as the proceedings of this Association, are culled over and formulas abstracted for preparations dispensed and sold by druggists.

Second. The wording of the resolutions does not include the National Formulary. Its standards are "official," and it is believed from the discussion at Hot Springs that it was clearly the intent of the mover to include this work also as official. If the National Formulary adopts, in future revisions, the plan of defining and fixing standards and tests for identity and purity for all "non-officinal" articles that enter into its formulas, then standards will be supplied for a number of the items appearing on these tentative lists. and the work of this committee will be considerably reduced. We recommend that the National Formulary be considered as included with the Pharmacopœia as official and that all articles so standardized by the N. F. be eliminated from consideration in this respect by this committee.

PLAN FOR THE CONTINUATION OF A PERMANENT COMMITTEE ON STANDARDS FOR NON-OFFICIALS.

From the tentative lists submitted it is apparent that the work of this committee will be along three distinct lines, namely, pharmaceutical, chemical and botanical. In the selection of the present committee the needs of the first two have been considered, but the necessity for the selection of a botanist and pharmacognocist appears to have been overlooked. It is, therefore, recommended that the membership of the committee be increased by the addition of at least one member who has made a special study of systematic botany and pharmacognosy, and that such addition be credited to the representation from pharmaceutical faculties.

The committee should be so constructed as to be able to continue its work without interruption and should have a reasonably permanent organization. The present committee was appointed for one year only, and if the Association decides to continue the work an active permanent committee should be inaugurated at this meeting. As a plan for such a committee the following is submitted: The Council shall appoint a standing committee of 16, of which number 4 shall be appointed for one year, 4 for two years,

4 for three years and 4 for four years, and that annually thereafter as the terms of four expire these vacancies shall be filled by the appointment of four for the full term of four years. This plan lends itself naturally to the four interests represented in the composition of the committee, as the term of one member of each would thus expire each year.

Vacancies occurring in the committee shall be filled by the Council for the unexpired term of the retiring member.

The Council shall annually designate the chairman of the committee. The committee shall be permitted to select annually a vice-chairman. In the event of the decease, incapacity or absence of the chairman, the vice-chairman shall continue the work of the committee, preparing, presenting reports, calling meetings of the committee when possible and performing all the duties of the chairman until the Council designates a chairman at the next annual meeting.

The committee shall submit an annual report to the Council of the progress of the work in a form suitable for publication, but such publication shall only be made in accordance with the instruction of the Council.

Principles and methods recommended for the guidance of the committee and the permanent continuance of the work.

The committee have considered a number of motions aiming to define the methods of procedure and the general principles to be observed in the preparation of standards, and the results of our deliberation are embodied in the following recommendations submitted to the Council for ratification.

1. *Method of Transacting the Business of the Committee:*

a. That a Secretary be not elected; since the business of the committee must be transacted by mail and all correspondence originate from one person, the Chairman should act as Secretary.

b. The business of the committee shall be transacted by bulletins issued at frequent intervals, if practicable, semi-monthly, as near the 1st and 15th of the month as possible.

c. All business to be brought before the committee shall be presented in the form of written motions: these shall not require a second and shall be submitted for discussion; the discussion shall appear in a subsequent bulletin and a time fixed for a vote on the adoption. This time shall, as a rule, be limited to 10 days from the date of transmission of the motion. For all *ordinary motions a majority* of the votes cast shall be considered as sufficient for decision.

d. It having been decided by vote that certain products are to be taken up for consideration, with the view of establishing standards, the Chairman shall assign each substance to a member of the Committee for report and recommendation. The report and recommendation of the referee for each product shall appear in the bulletin without the name of the referee being given, and the recommendations shall be submitted for discussion. Such discussions shall be submitted to the Committee in a subsequent bulletin and a vote on the adoption of the report called for. For the acceptance of such *referee's reports two-thirds of the vote of the entire Committee* must be in the affirmative.

2. *Titles to be Used in the Publication of Standards.*—The English titles shall be given the preference and be used throughout the work wherever practical, but the Latin titles and the technical or vernacular names and synonyms shall be given and, where listed alphabetically, cross references shall be given, adopting a "lexicon" style for this purpose. A different style of type might be adopted to indicate recognized titles from synonyms.

3. *Purity Rubric and Methods of Testing.*—The style adopted in the U. S. P. shall be followed in the purity statements and the official methods of defining identity and determining impurities and admixtures allowable shall also be followed.

In each product the standard shall correspond to the commercial pure product sold

under the name and suitable for the medicinal, technical or domestic uses for which it is intended.

4. *Avoidance of Conflict with U. S P. and N. F.*—Any article now recognized in the U. S. P. or the N. F. shall not be standardized by this Committee, providing the standards in these books have not been proven erroneous; and when any article included in the publication of this committee becomes recognized and standardized in either the U. S. P. or the N. F. it shall be deleted from the future publications of this committee, provided that the standard so adopted is satisfactory to the committee.

5. *Avoidance of Conflict with the U. S. Government Standards.*—The standards fixed by the U. S. Government shall be adopted unless they have been proven to be erroneous.

6. *Sources of Drugs and Products.*—The sources of drugs and of drug and chemical products shall be expressed in terms which comply with the actual facts and in keeping with the latest information available properly verified, regardless of the source from which such information is obtained.

Text-books do not always note the changes in commerce and some of the statements made as to sources are erroneous; particularly some of the statements published some years ago are no longer in keeping with the actual facts as some products and drug derivatives are now obtained from sources wholly different from what they were ten or twenty years ago.

7. *Botanical Classification and Nomenclature.*—In the monographs, citations of botanical sources and authorities shall follow the classification adopted in Engler and Prantl, "Natürliche Pflanzenfamilien," and the rules of botanical nomenclature adopted by the U. S. P. (see 7th Revision, fol. xxxii).

8. *Chemical Products:*

a. *Formulas and Molecular Weights.*—Simple chemical formulas shall be used, and as a basis for atomic weights and molecular calculations the Table of International Atomic Weights for 1909 be adopted. (Journal of the American Chemical Society, Vol. XXXI, No. 1.)

b. *Proprietary Products.*—The names of proprietary chemical products shall not be listed as titles in the publication of standards, but shall be incorporated as notes at the end of the monographs or as foot-notes, and all such names shall, however, be included in the index. Further, only such proprietary chemical products shall be considered as have definite chemical formulas or are definite chemical products, *not mixtures*, and in case of a patented proprietary product, the chemical formula (when feasible), the name of the patentee and date of the expiration of the patent shall be given. The chemical synonym to be stated in every instance.

9. *Pharmaceutical Preparations:*

a. *Non-Official Galenicals.*—Non-official galenical preparations that have a legitimate sale in the United States, especially those from foreign pharmacopœias, shall be included in the work and publications of the committee. Condensed formulas for these shall be given, and such approved formulas shall be considered as standards for such preparations. Assay processes shall not be deemed as necessary, but the committee may, at its option, append such processes to preparations.

b. *Proprietary Pharmaceuticals.*—The Committee shall not consider proprietary pharmaceutical preparations, nor shall they attempt to standardize or endorse such medicines.

10. *Doses and Medicinal Action.*—It is recommended that in the monograph references to doses and medicinal action be omitted, unless in describing poisonous articles a concise statement in this connection is deemed necessary to distinguish these from other products having the same or nearly similar names.

In describing such products as the closely allied aconitines, digitalins and strophanthins, statements of doses and actions may become essential to distinguish the products and to prevent serious errors.

11. *Expenses of Committee.*—If this work of establishing standards is to be pursued to a satisfactory conclusion and results obtained that will merit publication by the Association, it is apparent that an energetic standing committee will have to be appointed who will devote a great deal of their time and conscientious effort to the enormous labor entailed. Their expenses for materials, postage and stationery should be provided for. The amount of correspondence and clerical work that will have to be issued from the chairman's office will certainly be enormous and will probably necessitate some provision being made for clerical assistance. The work should not be hampered for the want of sufficient appropriations, and this subject should receive the consideration of the Council.

Respectfully submitted,

GEORGE M. BERINGER, *Chairman*,
J. M. FRANCIS,
THOS. P. COOK,
M. N. KLINE,
J. A. KOCH,
RICHARD FISCHER,
JAMES M. GOOD,
H. P. HYNSON,
LEO ELIEL,
G. D. ROSENGARTEN,
OTTO RAUBENHEIMER.

Camden, N. J., August 9, 1909.

TENTATIVE LIST OF CRUDE DRUGS AND SIMPLE PRODUCTS.

(*A*) *Animal Origin.*

Albumen, Blood
Albumen, Egg
Animal Ferments
Animal Organ Drugs
Ants' Eggs
Ambergris
Beef Extract
Beef Extract, Liquid
Beef Juice
Blatta Orientalis
Bone
Bone Ash
Bone Marrow
Calves' Rennets
Carmine
Castor
Chinese Blistering Beetles
Civet
Cream
Cuttle Bone
Eggs
Eye Stones
Ichthyocolla
Keratin
Lecithin
Milk
Oil, Animal
Oil, Neatsfoot
Oil, Sperm
Oil, Sturgeon
Oil, Whale
Oyster Shell (Testa)
Rennin
Seed Lac
Shellac
Sticklac
Vitellus

(*B*) *Mineral Origin.*

Amber
Armenian Bole
Asbestos
Asphaltum
Barbadoes Petroleum (Tar)
Bitumen
Boles, Various
Chalk
Coal Tar
Coal Tar Pitch
French Chalk
Fuller's Earth
Infusorial Earth
Kieselguhr
Lodestone
Oil, Amber

Oil, Amber, Rectified
Ozokerite
Pix Carbonis
Potter's Clay
Pumice
Rotten Stone
Soapstone
Spanish Brown
Terra Alba
Venetian Red
Yellow Ochre

(*C*) *Vegetable Origin.*

Abelmoschus Seed
Abrus Seeds
Abscess Root
Absinthe
Gentile
Lesser
Pontice
Roman
Acacia Bark
Acalypha
Aconite Leaves
Acorn Coffee
Adhatoda
Adonis Æstivalis
Adonis Vernalis (False Hellebore)
Adonis Vernalis, Root
Agar-Agar
Agaric
Agrimony
Ailanthus Bark
Alder, Black, Bark
Alder, Red, Bark
Aletris Rhizome
Alkanet Root
Allium
Aloes, Cape
Althaea Flowers
Althaea Leaves
Alum Root
American Senna
Ammoniacum
Anacardium Occidentale } Fruit.
Anacardium Orientale }
Andrographis
Angelica Root
Angelica Seed
Angostura Bark
Anise, Star
Annatto
Annatto Seed
Apple, Ripe
Apple, Sour
Aralia Nudicaulis
Aralia Racemosa, Root
Aralia (Aralia Spinosa)
Araroba, Goa Powder
Arbor Vitæ, *Herb*
Areca Nuts
Aristolochia Indica
Arnica Leaves
Arnica Root
Arrow Root
Arum
Asarum Canadense
Asarum Europeaum
Asclepias Incarnata
Asclepias Syriaca
Asclepias Tuberosa
Ash, Prickly, Berries
Asparagus Root
Asparagus Seed
Asperula Herb
Aspidosperma
Ava Root
Avena Sativa
Bael Fruit
Balm Gilead Buds
Balmony
Bamboo Brier Root
Barberry, Bark of Twigs
Barberry, Bark of Root
Barley
Bayberry Bark
Bayberry Wax
Bay Leaves
Bears Foot
Bebeeru Bark
Beech Drops
Beechwood Tar
Benne Leaves
Betel Fruit
Betel Leaves
Beth Root
Birch, Black, Bark
Birch Tar
Bistort Root
Bitter Root
Bittersweet Leaves

Bitter Sweet Stems
Black Alder Bark
Blackberry Juice
Black Hellebore
Black Oak Bark
Black Pitch
Black Walnut Bark
Black Walnut Leaves
Black Wattle Bark
Black Willow Bark
Black Willow Buds
Bladder Wrack
Blessed Thistle
Blue Cohosh
Blue Flag Root
Blue Gentian (Gentian Catesbei)
Boldo Leaves
Borage Flowers
Borage Leaves
Broom Corn Seed
Bryonia Root
Buchu Leaves, Long
Buckbean Leaves
Buckbean Root
Buckthorn Berries
Bugle Weed
Burdock Seed
Burgundy Pitch
Butea Gum
Butea Seed
Butternut Bark
Button Snake Root
Cacao Beans
Cacao Powder
Cactus Grandiflorus
Calotropis (Mudar)
Canada Snake Root
Canary Seed
Cancer Root
Cannella Bark
Cannabis Americana
Caramel
Carduus Benedictus
Carduus Marianus, Seed
Caroba Leaves
Carrot Seed
Cascara Amarga
Cascarilla Bark
Cassava
Cassia Bark, China
(Chinese Cinnamon)
Cassia Buds
Castanea
Catechu
Catnep
Caulophyllum
Cedron Seed
Celandine
Celery Seed
Centaury, American
Centaury, Minor
Cetraria
Chekan Leaves
Chenopodium
Chestnut Leaves
Chicory Root
China Root
Chocolate
Clary
Cleavers
Clover Tops, Red
Cocculus Indicus
Coffee Seed, Green
Coffee, Roasted
Coltsfoot Leaves
Coltsfoot Root
Comfrey Root
Condurango Bark
Conium Leaves
Convallaria majalis, Flowers
Coolroot Leaves
Coptis Trifolia, Rhizome and Rootlets
Corn Ergot
Corn Smut
Cornus Circinata, Bark
Cornus Florida, Root Bark
Corydalis, Tubers
Coto Bark
Cowhage
Crawley Root
Crea Monda
Crocus
Crowfoot
Cudbear
Cummin Seed
Cutch
Cyani Flowers
Damiana
Datura Seed
Deer Tongue
Diastase
Dicentra Canadensis, Tubers
Dill Seed
Dioscorea

Dita Bark
Dittany Herb
Dittany, Crete
Dogsbane
Dogwood, Bark of Tree
Dogwood, Bark of Root
Dogwood, Swamp, Bark
Dogwood, Jamaica
Dragons' Blood
Duboisia Herb
Dwarf Elder
Echinacea Angustifolia, Herb
Elaterium
Elder Flowers
Elecampane Root
Erigeron, Philadelphia
Erythraea Centurium
Euphorbia Corollata
Euphorbia Ipecacuanha
Euphorbia Pilulifera
Evening Primrose
Eyebright
False Bittersweet
False Sarsaparilla Root
Fever Root
Figwort
Five-flowered Gentian
Flaxseed Meal
Fleabane, Canada
Foenugreek Seed
Frankincense
Fringe Tree Bark
Frostwort
Galangal Root
Galega Herb
Garlic
Gaultheria
Germander
Gillenia
Gin
Ginipiglio Flowers
Ginseng
Goats' Rue
Goldenrod
Goldthread
Grains of Paradise
Gravel Plant
Green Osier Bark
Ground Ivy
Guaiac Wood, or Chips
Gum Ammoniac
Gum Butea
Gum Copal
Gum Damar
Gum Eucalyptus
Gum Euphorbium
Gum Galbanum
Gum Olibanum
Gum Hemlock
Gum, Red
Gum Sandarac
Gum, Spruce
Gum Tamarack
Gurjun Balsam
Guttapercha
Haircap Moss
Hardhack
Hawthorn Berries
Heartsease
Hellebore, Black
Hellebore, False
Helonias
Hemlock Bark
Hemp Seed
Henna Leaves
Hepatica
Heuchera
Hickory Bark
Horse Chestnut Bark
Horsemint
Horse Nettle Berries
Horse Nettle Root
Horse Radish Root
Hydrangea Root
Hyoscyamus Seed
Hyssop
Iceland Moss
Ignatius Beans
Illicium
Indigo
Insect Flowers
Insect Powder
Iris Versicolor
Iron Wood
Jamaica Rum
Jambul Seed
Jequirity Seed
Jersey Tea
Job's Tears
Johnswort
Juniper Berries
Kamela
Kava Kava
Kidney Wort

Kola Nuts
Larkspur Seed
Laurel Bay Leaves
Laurel Berries
Lavender Flowers
Lemon Balm
Life Everlasting
Life Root Plant
Lily of Valley Flowers
Lime Juice
Linseed Meal
Linden Flowers
Linden Leaves
Lippia Mexicana
Liriodendron
Liverwort Leaves
Lobelia Seed
Lovage Leaves
Lovage Root, American
Lovage Root, European
Lovage Seed
Lungwort Leaves
Mace
Madder
Magnolia Bark
Maidenhair Fern
Mallow Herb, Common
Mallow Flowers
Malt
Manaca Root
Manzanita Leaves
Marjoram
Marsh Rosemary Root
Maw Seed
May Weed
Melilot Flowers
Melissa Herb
Menispermum
Menyanthes Trifolium
Milkweed Root
Mistletoe, American
Mistletoe, European
Molasses
Monarda
Motherwort
Mountain Ash Bark
Mugwort
Muira Puama
Mullein Flowers
Mullein Leaves
Mullein Root
Nasturtium Leaves
Navelwort
Nectandra
Nettle Root
Nigella Seed
Nuclein
Oats
Oatmeal
Oil, Absinthe
Oil, Angelica
Oil, Bay
Oil, Benne
Oil, Bergamot
Oil, Birch Tar
Oil, Camphor
Oil, Cardamom
Oil, Castor, Crude, *Technical*
Oil, Chamomile
Oil, Chaulmoogra
Oil, Citronella
Oil, Cocoanut, Crude, *Technical*
Oil, Cocoanut, Refined
Oil, Geranium
Oil, Hemlock
Oil, Horsemint
Oil, Laurel Berries
Oil Lavender, Garden
Oil Lavender, Spike
Oil Lemongrass
Oil Linseed, *Technical*
Oil Linseed, Boiled, *Technical*
Oil Mace
Oil Olive, Malaga
Oil Orange Berries
Oil Orange Flowers
Oil Orange Peel, Bitter
Oil Orange Peel, Mandarin
Oil Origanum
Oil Palm
Oil Peach Kernel
Oil Peanut
Oil Red
Oil Rue
Oil Sesame
Oil Spruce
Oil Tansy
Oil Tobacco
Oil Valerian
Oil Verbena
Orange Apples
Orange Buds
Orange Flowers
Origanum

Orris Root, Florentine
Orris Root, Verona
Pansy Herb
Papain and similar Vegetable Ferments
Paprika
Para Coto Bark
Parsley Leaves
Parsley Root
Parsley Seed
Passion Flower Herb
Patchouli Leaves
Pellitory Root
Peony Flowers
Peony Root
Pepper, White
Persimmon Bark
Pichi Herb
Pimpinella Root
Pine Buds
Pine Needles
Pitch, Black
Pitch, Canada
Pitch, Hemlock
Pitcher Plant
Plantain Leaves
Pleurisy Root
Poison Oak Leaves
Poke Berries
Pomegranate, Bark of Root
Pomegranate, Rind of Fruit
Poplar, Black, Bark
Poplar, White, Bark
Poplar, Yellow, Bark
Poppy Capsules
Poppy Flowers
Poppy Leaves
Poppy Seed
Potato Starch
Prickly Ash Berries
Pulsatilla
Quebracho Bark
Queen of Meadow Root
Quince Seed
Ragweed
Raisins
Ranunculus
Raspberry Leaves
Red Cedar
Red Gum
Rhus Aromatica
Rice Flour
Rose, Pale, Petals
Rosemary Leaves
Rosinweed Herb
Rosinweed Root
Rue
Sabadilla
Safflower
Saffron
Saffron, American
Sago
St. John's Bread
Salep
Sampson Snake Root
Sandalwood
Sappan
Saxifrage
Scouring Rush
Sea Wrack
Senna Pods
Sesame Leaves
Shepherd's Purse
Sideritis Herb
Silk Weed
Simaruba Bark
Skunk Cabbage Root
Sloe Berries
Smart Weed
Snake Root, Button
Snake Root, Canada
Soap Root
Soap Wort
Solomon's Seal Root
Sourwood Leaves
Southernwood
Spikenard Root
Spiraea
Squaw Vine
Star Grass
Star Root
Stone Root
Strawberry Leaves
Sumach Bark
Sumach Leaves
Summer Savory
Sundew Herb
Sunflower Seed
Swamp Dogwood
Sweet Balm
Sweet Basil
Sweet Fern
Syrupus Fuscus
Tag Alder Bark
Tamarack Bark

Tamarinds
Tansy
Tapioca
Taragon Leaves
Tea
Thyme
Tobacco
Tonka Beans
Tonga Bark
Tormentilla Root
Trailing Arbutus
Trifolium Fibrinum
Triosteum
Tulip Tree, Bark
Turkey Corn
Turmeric
Turpeth Root
Twin Leaf
Unicorn Root
Unicorn, False, Root
Venice Turpentine
Vanilla Leaf
Vervain, Blue
Viola Tricolor
Violet Flowers
Violet Root (Viola Pedata 1870)
Virgin's Bower
Wafer Ash Bark
Waldmeister
Walnut, Black, Bark
Walnut Leaves
Water Avens Root
Water Eryngo
Water Fennel
Water Hemlock
Watermelon Seed
Water Pepper
Wax, Carnauba
Wax, Japan
Wheat Starch
White Ash Bark
White Pine Bark
White Pond Lily
White Poplar Bark
Wild Indigo Herb
Wild Indigo Root
Wild Lettuce
Wild Marjoram
Wild Turnip
Wild Yam
Willow, Black, Bark
Willow, Black, Buds
Willow, White, Bark
Wintergreen Leaves
Winter's Bark
Wine, Angelica
Wine, Catawba
Wine, Champagne
Wine, Claret
Wine, Orange
Wine, Port
Wine, Sherry
Wine, White
Wood, Betony
Woodruff
Wormseed
Wormwood
Xanthorrhiza
Yarrow
Yellow Dock Root
Yellow Root
Yerba Buena
Yerba Ruema
Yohimbihi Bark
Zedoary Root

TENTATIVE LIST OF NON-OFFICIAL PHARMACEUTICAL PREPARATIONS.

Abstract, Aconite
Abstract, Belladonna
Abstract, Conium
Abstract, Digitalis
Abstract, Hyoscyamus
Abstract, Ignatia
Abstract, Jalap
Abstract, Nux Vomica
Abstract, Podophyllum
Abstract, Senega
Abstract, Valerian
Acetum Destillatum
Cerate, Cantharides Extract
Cerate, Savine
Cerate, Soap
Cerate, Spermaceti
Cerate, Zinc Carbonate
Confection, Aromatic
Confection, Opium
Confection, Orange Peel
Confection, Pepper, Black
Curry Powder
Decoction, Barley
Decoction, Chimaphila

Decoction, Cinchona, Red
Decoction, Cinchona, Yellow
Decoction, Dogwood
Decoction, Dulcamara
Decoction, Iceland Moss
Decoction, Logwood
Decoction, Sarsaparilla, Compound
Decoction, Senega
Decoction, White Oak
Decoction, Uva Ursi
Distilled Vinegar
Effervescing Powders
Elixir e Succo Liquiritiae
Elixir, Formates
Elixir, Glycerophosphates, Compound
Elixir, Orange
Elixir, Phosphorus
Emulsion, Ammoniac
Ergotin
Essence of Almond
Essence of Ginger
Essence of Lemon
Essence of Orange
Essence of Peppermint
Essence of Rose
Extract, Aconite
Extract, Aconite Leaves
Extract, Arnica Flowers
Extract, Arnica Root
Extract, Beef
Extract, Belladonna (1870)
Extract, Cannabis Purificatum
Extract, Cannabis American
Extract, Cinchona
Extract, Conium
Extract, Dulcamara
Extract, Hellebore
Extract, Hyoscyamus (1870)
Extract, Ignatia
Extract, Iridis
Extract, Jalap
Extract, Malt (dry)
Extract, Malt and Cod Liver Oil
Extract, Podophyllum
Extract, Senega
Extract, Stramonium (1870)
Extract, Stramonium Seed
Extract, Uva Ursi
Extract, Valerian
Fluidextract, Buckthorn Berries
Fluidextract, Erigeron
Fluidextract, Grindelia, Alkaline, Soluble
Fluidextract, Larkspur
Fluidextract, Lobelia (Hydroalcoholic)
Fluidextract, Malt
Fluidextract, Mezereum
Fluidextract, Rhubarb, Aromatic
Fluidextract, Sanguinaria (Hydroalcoholic)
Fluidextract, Spigelia and Senna
Fluidextract, Squill (Hydroalcoholic)
Gauze, Aseptic
Gauze, Borated
Gauze, Carbolated
Gauze Corrosive Sublimated
Gauze, Iodoform
Glycerite, Carbolic Acid
Glycerite, Gallic Acid
Glycerite, Tannic Acid
Glycerite, Yolk of Egg
Golden Tincture
Headache Cologne
Hoffmann's Anodyne
Honey of Borax
Honey of Rose and Borax
Infusion, Angostura
Infusion, Chamomile
Infusion, Columbo
Infusion, Capsicum
Infusion, Cascarilla
Infusion, Cloves
Infusion, Catechu, Compound
Infusion, Eupatorium
Infusion, Hops
Infusion, Juniper
Infusion, Krameria
Infusion, Flaxseed, Compound
Infusion, Pareira
Infusion, Tar
Infusion, Quassia
Infusion, Rhubarb
Infusion, Taraxacum
Infusion, Sage
Infusion, Senna
Infusion, Valerian
Juice, Conium
Juice, Taraxacum
Kummerfeld's Cosmetic Lotion
Liniment, Aconite
Liquor Picis Carbonis Detergens
Mixture, Aloes and Soda
Mixture, Potassium Citrate
Neutral Mixture
Normal Salt Solution
Oil Castor, Aromatized

Oil Cod Liver, Aromatized
Oil Cod Liver with Iron Iodide
Oil, Phosphorated
Ointment, Antimonial
Ointment, Cantharides
Ointment, Creosote
Ointment, Iodine, Compound
Ointment, Red Iodide, Mercury
Ointment, Sulphur Iodide
Ointment, Tobacco
Ointment, Witch Hazel
Oyster Shell, Prepared
Pill, Niemeyer
Pill, Quinine Sulphate
Pill, Squill, Compound
Pill, Soap, Compound
Plaster, Aconite
Plaster, Antimony
Plaster, Belladonna and Capsicum
Plaster, Isinglass
Plaster, Tar
Resin, Copaiba
Saccharum Aromaticum
Saccharum Tostum
Solution, Aluminum Acetate (Burow)
Solution, Barium Chloride
Solution, Calcium Chloride
Solution, Glycerophosphates, Compound
Solution, Hydrastine, Compound
Solution, Morphine Sulphate
Solution, Pepsin
Solution, Potassium Permanganate
Spiritus Ammonii Anisatus
Suppositories, Carbolic Acid
Suppositories, Tannic Acid
Suppositories, Lead
Suppositories, Lead and Opium
Syrup of Cherries
Syrup of Lemon
Tablets, Coryza
Tablets, Hepatic
Tablets, Hypodermatic
Tablets, Migraine
Tablets, Rhinitis
Tincture, Aconite Leaves
Tincture, Aromatic
Tincture, Avena Sativa
Tincture, Bark, Huxham's
Tincture, Castor
Tincture, Caramel
Tincture, Catechu Compound
Tincture, Cocculus Indicus
Tincture, Echinacea
Tincture, Eupatorium
Tincture, Euphrasia
Tincture, Hellebore
Tincture, Huckleberry
Tincture, Ignatia, Compound
Tincture, Iodine, Compound
Tincture, Iron Acetate
Tincture, Larkspur
Tincture, Lupulin
Tincture, Opium, Acetic
Tincture, Quinine, Ammoniated
Tincture, Rhubarb and Senna
Tincture, Stavesacre
Vinegar, Colchicum
Vinegar, Lobelia
Vinegar, Sanguinaria
Warner's Gout Cordial
Wine, Aromatic
Wine, Tobacco
Water, Carbolic
Water, Carbonic
Water, Cherry Laurel
Water, Elder Flower
Waters, Aromatic
Waters, Aromatic, Spirituous

TENTATIVE LIST OF NON-OFFICIAL CHEMICALS USED IN THE ARTS AND MEDICINE.

Acetic Anhydride
Acetone, *Technical*
Acetyl-Amido-Phenyl-Salicylic Ester (Salophen)
Acid, Acetic, Commercial, *Technical*
Acid, Butyric
Acid, Cacodylic
Acid, Carbolic, Crude, *Technical*
Acid, Cinnamic, purified
Acid, Cresylic, Crude, *Technical*
Acid, Formic
Acid, Formic, Concentrated
Acid, Glycerophosphoric
Acid, Hydrobromic, Concentrated
Acid, Hydrochloric, Commercial, *Technical*
Acid, Hydrofluoric, *Technical*
Acid, Hydrosilicofluoric, *Technical*
Acid, Molybdic, purified
Acid, Monochloracetic
Acid, Muriatic, *Technical*
Acid, Nitric, Commercial, *Technical*
Acid, Nitric, Parting

Acid, Nitrous, Fuming, *Technical*
Acid, Osmic
Acid, Oxalic, *Technical*
Acid, Phenol-Sulphonic (Sozolic Acid)
Acid, Phosphoric, Glacial
Acid, Phosphoric, Meta
Acid, Picric
Acid, Pyrogallic, *Technical*
Acid, Pyroligenous, *Technical*
Acid, Salicyl Acetic (Aspirin)
Acid, Salicic
Acid, Succinic, Pure
Acid, Sulphanilic
Acid, Sulphuric, *Technical* (Oil of Vitriol)
Acid, Sulphuric, Fuming (Nordhausen) *Technical*
Acid, Tannic, *Technical*
Acid, Valeric
Agaricin
Alcohol, *Commercial*, *Technical*
Alcohol, Denatured
Alcohol, Methyl
Alcohol, Wood
Alkannin
Alum, Ammonium
Alum, Ammonium, Dried
Alum, Chrome, *Technical*
Aluminum
Aluminum Acetate, Solution
Aluminum Borotartrate
Aluminum Chloride
Aluminum Phenolsulphonate
Aluminum Salicylate
Aluminum Sulphate, Commercial, *Technical*
Ammonia Water, *Technical*
Ammonium Acetate
Ammonium Arsenate
Ammonium Bisulphate
Ammonium Bitartrate
Ammonium Chloride, Commercial, *Technical*
Ammonium Citrate
Ammonium Dichromate
Ammonium Hydrosulphuret
Ammonium Hypophosphite
Ammonium Ichthyol-Sulphonate
Ammonium Molybdate
Ammonium Nitrate
Ammonium Oxalate, Commercial, *Technical*
Ammonium Persulphate
Ammonium Phenolsulphonate
Ammonium Phosphate, Commercial, *Technical*
Ammonium Phosphate, Purified
Ammonium Sulphate, Commercial, *Technical*
Ammonium Sulphide
Ammonium Sulphite
Ammonium Sulphocyanide
Ammonium Tartrate
Amyl Acetate
Amyl Butyrate
Amyl Formate
Amyl Nitrate
Amyl Valerate
Amyl Alcohol
Amylene Hydrate
Anethol
Aniline
Antimony Black
Antimony Needle
Antimony Chloride
Antimony Chloride, Solution, *Technical* (Butter of Antimony)
Antimony Oxide, White, *Technical*
Antimony Oxy-sulphuret
Antimony Sulphurated
Antimony Sulphide
Antimony Sulphide, Purified
Apiol, Cryst, White
Apiol (Green)
Apocodeine Hydrochloride
Apomorphine Hydrochloride, Amorphous
Aqua Fortis, *Technical*
Arecolin Hydrobromide
Argols
Arsenic Bromide
Arsenic Chloride, Liquid
Arsenic Iodide, Fused
Arsenic Sulphide
Arsenicum
Asparagin
Barium Acetate
Barium Bromide
Barium Carbonate
Barium Carbonate, Purified
Barium Chlorate, *Technical*
Barium Chlorate Purified, *Technical*
Barium Chloride, Commercial, *Technical*
Barium Chloride, Purified
Barium Dioxide
Barium Nitrate
Barium Oxide, Hydrated

Barium Peroxide
Barium Sulphate, Commercial, *Technical*
Barium Sulphide, Commercial
Barium Sulphide, Purified
Benzole
Benzonaphthol
Betol
Bismuth Acetate
Bismuth Benzoate
Bismuth Betanaphthol
Bismuth Chloride
Bismuth Glycerite
Bismuth Lactate
Bismuth Metal
Bismuth Nitrate
Bismuth Oleate
Bismuth Oxide, Anhydrous, Yellow
Bismuth Oxide, Hydrated
Bismuth Oxychloride
Bismuth Phenolsulphonate
Bismuth Phosphate
Bismuth Salicylate
Bismuth Subbenzoate
Bismuth Subiodide
Bismuth Sulphate
Bismuth Sulphide
Bismuth Tannate
Bismuth Valerate
Blue Stone
Blue Vitriol, *Technical*
Blue Vitriol, Dried, *Technical*
Brucine, Alkaloid
Brucine Sulphate
Butyl-Chloral Hydrate
Cadmium Metal
Cadmium Bromide
Cadmium Iodide
Cadmium Salicylate
Cadmium Sulphate
Cadmium Sulphide
Caffeine Acetate
Caffeine Benzoate
Caffeine Hydrobromide
Caffeine Hydrochloride
Caffeine Phosphate
Caffeine Salicylate
Caffeine Sulphate
Caffeine Valerate
Caffeine and Sodium Benzoate
Caffeine and Sodium Salicylate
Calamine
Calcium Acetate
Calcium Acetate, Purified
Calcium Benzoate
Calcium Carbide
Calcium Chloride, Commercial, *Technical*
Calcium Dichromate
Calcium Formate
Calcium Glycerophosphate
Calcium Hyposulphite
Calcium Iodide
Calcium Lactate
Calcium Lactophosphate, Insoluble
Calcium Lactophosphate, Soluble
Calcium Nitrate
Calcium Oxalate
Calcium Peroxide
Calcium Phenolsulphonate
Calcium Phosphate, Acid
Calcium Salicylate
Calcium Sulphate, Purified
Calcium Sulphite
Calcium and Sodium Hypophosphite
Cantharidin
Carbon Tetrachloride, *Technical*
Cerium Carbonate
Cerium Nitrate
Cerium Oxide
Chinoidin
Chromium Sulphate
Cinchonidine, Alkaloid
Cinchonidine Bisulphate
Cinchonidine Dihydrobromide
Cinchonidine Hydrobromide
Cinchonidine Hydrochloride
Cinchonidine Salicylate
Cinchonine, Alkaloid
Cinchonine Bisulphate
Cinchonine Hydrochloride
Cinchonine Salicylate
Cinnabar
Codeine Hydrochloride
Codeine Nitrate
Codeine Valerate
Coniine Hydrobromide
Copper Wire (U. S. F. 1870)
Copper Acetate, Crude
CopperAcetate, Purified
Copper Ammoniated
Copper Arsenite
Copper Carbonate, True, *Technical*
Copper Chloride
Copper Citrate
Copper Cyanide

Copper Iodide
Copper Nitrate
Copper Oleate
Copper Oxide, Black
Copper Oxide (Cuprous)
Copperas, *Technical*
Cotarnine Hydrochloride (Stypticin)
Crab Orchard Salt, Artificial
Crocus Martis, *Technical*
Crocus Metallorum (Liver Antimony) *Technical*
Coumarin
Curarine
Dextrin, White
Dextrin, Yellow
Diacetyl-Morphine
Diacetyl-Morphine Hydrochloride
Di-Acetyl Tannin (Tannigen)
Diethylene-Diamine (Piperazine)
Digitalin
Digitoxin
Eikonogen
Ether, Benzoic
Ether, Butyric
Ether, Formic
Ether, Hydriodic
Ether, Hydrobromic
Ethyl Bromide
Ethyl Iodide
Ethyl Nitrite
Ethyl Nitrate
Ethyl-Morphine Hydrochloride (Dionin)
Eucaine
Fusel oil, *Technical*
Glauber's Salt, *Technical*
Glucose
Gold Bromide, Mono
Gold Bromide, Tri
Gold and Sodium Bromide
Gold Chloride
Gold and Sodium Chloride, *Technical*
Gold Cyanide, Mono
Gold Iodide
Gold Oxide
Guaiacol Benzoate
Hydroquinone
Hyoscyamine Sulphate
Iron Arsenate
Iron Bromide
Iron Carbonate, Precipitated
Iron Chloride, Proto
Iron and Manganese Citrate
Iron and Magnesium Citrate
Iron, Manganese and Strychnine Citrate
Iron and Potassium Citrate
Iron, Quinine and Strychnine Citrate
Iron Ferrocyanide, Commercial, *Technical*
Iron Ferrocyanide, Soluble, Commercial, *Technical*
Iron Ferrocyanide, Pure
Iron Glycerophosphate
Iron Iodide
Iron Iodide, Saccharated
Iron Lactate (Ferrous)
Iron Lactophosphate
Iron Nitrate
Iron Nitrate, Solution 45°, *Technical*
Iron Oxalate
Iron and Ammonium Oxalate (Ferric), *Technical*
Iron and Potassium Oxalate
Iron and Sodium Oxalate
Iron Oxide, Black
Iron Oxide, Saccharated
Iron, Peptonized
Iron and Manganese, Peptonized
Iron and Quinine Pyrophosphate
Iron Subcarbonate
Iron Sulphuret, *Technical*
Iron Tartrate
Iron and Ammonium Tartrate
Iron and Potassium Tartrate
Iron Valerate (Ferric)
Kermes Mineral
Lapis Divinus
Lead Arsenate, Commercial, *Technical*
Lead Chloride
Lead Hyposulphite (Thiosulphate)
Lead Carbonate
Lead Carbonate, Purified
Lead Oxide, Red
Lime, Carbolated
Lime Bisulphite, Solution
Lithium Acetate
Lithium Benzosalicylate
Lithium Bitartrate
Lithium Chloride
Lithium Dichromate
Lithium Formate
Lithium Glycerophosphate
Lithium Hypophosphite
Lithium Iodide
Lithium Lactate
Lithium Nitrate

Lithium Oxide, Hydrated
Lithium Phosphate
Lithium Sulphate
Lithium Tartrate
Litmus Cubes
London Purple
Lye, Potash
Lye, Soda
Magnesium Acetate
Magnesium Benzoate
Magnesium Borocitrate
Magnesium Bromide
Magnesium Carbonate, *Technical*
Magnesium Chloride
Magnesium Citrate, Insoluble
Magnesium Citrate, Soluble
Magnesium Formate
Magnesium Glycerophosphate
Magnesium Hypophosphite
Magnesium Iodide
Magnesium Lactate
Magnesium Lactophosphate
Magnesium Nitrate
Magnesium Oxide, *Technical*
Magnesium Phosphate
Magnesium and Ammonium Phosphate
Magnesium Salicylate
Magnesium Sulphate, Anhydrous
Manganese Acetate
Manganese Benzoate, True
Manganese Binoxide
Manganese Borate
Manganese Carbolate
Manganese Carbonate
Manganese Chloride
Manganese Chloride, C. P.
Manganese Citrate, Insoluble
Manganese Glycerophosphate
Manganese Hypophosphite
Manganese Iodide
Manganese Lactate
Manganese Nitrate
Manganese Oxide, Black (Dioxide) *Technical*
Manganese Peptonate
Manganese Phosphate
Mercury Acetate (Mercurous)
Manganese and Ammonium Citrate, Soluble
Manganese and Sodium Citrate, Soluble
Mercury Benzoate (Mercuric)
Mercury Bisulphate (Mercuric)
Mercury Binoxide, Proto
Mercury Cyanide (Mercuric)
Mercury Nitrate (Mercuric)
Mercury Nitrate (Mercuric), Crystals
Mercury Oxycyanide
Mercury Salicylate (Mercuric), Basic, 58 per cent.
Mercury Salicylate (Mercuric), Neutral, 42 per cent.
Mercury Subsulphate, Yellow
Mercury Sulphide, Red
Microcosmic Salt
Minium
Morphine Bromide
Morphine-Diacetyl, Alkaloid
Morphine-Diacetyl Hydrochloride
Morphine-Ethyl Hydrochloride
Myrtol
Naphtha, Coal Oil
Naphtha, Coal Tar
Naphtha, Wood
Naphthalene
Naphthalol (Betol)
Naphthol Beta-Benzoate
Nickel Bromide
Nickel Sulphate
Nickel and Ammonium Sulphate
Oil of Vitriol
Paris Green
Pearl Ash
Peptone, Dry
Phenolphthalein
Phloridzin
Phosphorus
Phosphorus, Amorphous, Red
Picrotoxin
Platinum Chloride
Potassa Cum Calce
Potassa Sulphurata
Potassium Benzoate
Potassium Binoxalate
Potassium Bisulphate
Potassium Bisulphite
Potassium Bisulphite, Meta
Potassium Boro-Tartrate (Soluble Cream of Tartar)
Potassium Carbonate, Crude, *Technical*
Potassium Chloroplatinate
Potassium Chromate, *Technical*
Potassium Cyanide, Commercial, *Technical*
Potassium Dichromate, *Technical*
Potassium Ferricyanide (Red Prussiate Potash), *Technical*

Potassium Fluoride
Potassium Formate
Potassium Glycerophosphate
Potassium Guaiacol-Sulphonate (Thiocol)
Potassium Hydroxide, Commercial, *Technical*
Potassium Nitrate, Fused
Potassium Nitrate, Purified
Potassium Phenolsulphonate
Potassium Phosphate
Potassium Salicylate
Potassium Sulphide
Potassium Sulphite
Potassium Tartrate
Prussian Blue
Prussian Blue, Soluble
Pyoktanin
Quinidine, Alkaloid
Quinidine Salicylate
Quinidine Sulphate
Quinine Acetate
Quinine Arsenate
Quinine Bimuriate
Quinine Citrate
Quinine Dihydrobromide
Quinine Ethyl chlorocarbonate (Euquinine)
Quinine Ferrocyanide
Quinine Tannate
Quinine Glycerophosphate
Quinine Hydrochlorosulphate
Quinine Hypophosphite
Quinine Iodide
Quinine Lactate
Quinine Phenolsulphonate
Quinine Phosphate
Quinine Tannate
Quinine Valerate
Quinine and Urea Bimuriate
Red Lead
Rubidium Bromide
Sal Acetosella
Sal Ammoniac
Sal Prunelle
Sal Soda
Salt, Common
Saltpetre, Commercial, *Technical*
Saltpetre, Chili
Silver Metal
Silver Bromide
Silver Chloride
Silver Citrate
Silver Iodide
Silver Lactate
Silver Oxide
Sodium Arsenate, Commercial, *Technical*
Sodium Arsenite, *Technical*
Sodium Bisulphate
Sodium Cacodylate
Sodium Chromate, *Technical*
Sodium Cinnamate
Sodium Dichromate
Sodium Formate
Sodium Glycerophosphate
Sodium Hydroxide, Commercial, *Technical*
Sodium Lactophosphate
Sodium Nitrate, Crude, *Technical*
Sodium Oleate
Sodium Oxalate, Commercial, *Technical*
Sodium Perborate
Sodium Peroxide
Sodium Phosphate, *Technical*
Sodium Pyrophosphate, *Technical*
Sodium Santoninate
Sodium Silicate
Sodium Silicate Solution, *Technical*
Sodium Succinate
Sodium Sulphide
Sodium Sulphide, Crude, *Technical*
Sodium Sulphovinate
Sodium Tartrate
Spirit of Hartshorn
Starch, Iodized
Strontium Arsenite
Strontium Carbonate
Strontium Carbonate, Purified
Strontium Chloride
Strontium Formate
Strontium Glycerophosphate
Strontium Hypophosphite
Strontium Lactate
Strontium Nitrate, Commercial, *Technical*
Strontium Oxide, Hydrated
Strontium Phosphate
Strontium Sulphide
Strychnine Acetate
Strychnine Arsenate
Strychnine Bromide
Strychnine Citrate
Strychnine Formate
Strychnine Glycerophosphate
Strychnine Hydrochloride
Strychnine Hypophosphite
Strychnine Lactate
Strychnine Phosphate

Tannin, *Technical*
Thalline Sulphate
Theobromine
Toluol
Trimethylamine Hydrochloride
Tropacocaine
Turpeth Mineral
Urea, Pure
Verdigris
Vermillion
Water Glass
White Lead
White Vitriol
Xylol
Zinc Benzoate
Zinc Borate
Zinc Bromide
Zinc Chloride Solution, *Technical*
Zinc Cyanide
Zinc Ferrocyanide
Zinc Hypophosphite
Zinc Lactate
Zinc Nitrate, Purified
Zinc Oleate
Zinc Oxalate
Zinc Oxide, Commercial, *Technical*
Zinc Permanganate
Zinc Peroxide
Zinc Phosphate
Zinc Phosphide
Zinc Subgallate
Zinc Sulphate, Commercial, *Technical*
Zinc Tannate
Zinc White

The following letter was read from H. P. Hynson, on the report of Committee of Non-Official Drugs and Chemical Products:

August 14, 1909.

Mr. Joseph W. England, Secretary, Los Angeles, California:

My Dear Sir: I am quite anxious to commend to the Council the splendid work done by Mr. Beringer as Chairman of the Committee on Non-Official Standards. It is one of the times that I wish my approval was worth more than it really is. I agree with the report in almost every particular, and if a majority of the committee favors it I hope you will add my signature. I am, however, convinced that the committee is entirely too large; instead of having four members from each branch or division, as suggested, I should like to see one representative from each, and a chairman, making five altogether. I believe much better work would be done with a committee of this size than one made of sixteen members. I cannot confess myself individually pleased with the tentative list submitted. In my opinion it is entirely too voluminous. I think the committee should not attempt to deal with compounds of any character, especially galenicals. This should be left to the Committee on National Formulary, and the new "receipt book," which, of course, will be put in operation.

Hoping you are having a delightful time, and wishing it were possible for me to be with you, I am,

Yours very truly, H. P. Hynson.

A similar communication was received from Leo Eliel, as follows:

South Bend, *August 13th, 1909.*

Mr. J. W. England, *Secretary Council, A. Ph. A., Los Angeles, Cal.*

Dear Mr. England: Will you please affix my name to the report sent you by Mr. George M. Beringer, as Chairman of the Committee on Non-Official Drugs and Chemical Products. It meets with my entire approval, and represents an enormous amount of work, carefully tabulated, with an admirable scheme for the guidance of the General Committee to follow in working out the proposition.

I sincerely hope that the Council will see its way clear for continuing this very important undertaking.

It is a matter of great regret to me that I cannot attend this meeting.

With best wishes for a pleasant and profitable meeting, I am, with kindest regards,

Yours truly, Leo Eliel.

The following resolutions were offered by Jas. H. Beal and seconded by J. A. Koch:

1st. The committee is instructed that the words "medicinal preparations" are to be construed to include any and all *non-official* galenical, pharmaceutical or other preparations, regardless of their source or composition, provided they are such as may properly be sold by druggists.

It is expected, however, that the committee will exercise a sound discretion in making its selections, in order that the standards of the committee when completed shall be of real and practical value to the retail druggist.

2d. The Council considers the National Formulary as included within the Pharmacopœia in the resolutions which created the committee, and that preparations dropped from the National Formulary should be included in the list of unofficial preparations to be prepared by the Committee on Unofficial Standards.

3d. The Council approves the plan proposed for the organization and continuation of the committee, except as stated in the paragraph following.

4th. In the selection of the members of the committee, the Council will, in the future, consider first their fitness for the work to be done, without special regard to the particular branch of pharmacy with which the members may be affiliated.

5th. The Council approves provisionally the following recommendations of the committee:

Concerning the Methods of Transacting the Business of the Committee.

Concerning the Titles to be used in the Publication of the Standards.

Concerning the Purity Rubric and Methods of Testing.

Concerning the Avoidance of Conflict with the United States Pharmacopœia and National Formulary.

Concerning the Avoidance of Conflict with the U. S. Government Standards.

Concerning the Statement of Sources of Drugs and their Products.

Concerning Classification and Nomenclature.

Concerning Formula, Molecular Weights and Proprietary Chemical Products.

Concerning Non-Official Galenicals and Proprietary Pharmaceuticals.

Concerning the Statement of Doses and Medical Action.

By "provisional approval" is meant approval subject to the right of the Council to revise the past or any future action of the Committee.

6th. For the immediate expenses of the Committee on Unofficial Standards the Council appropriates $100.00, or so much thereof as may be necessary.

7th. As the official formal title of this Committee, the Council approves the following; "*The Committee on Standards for Non-Official Drugs, Pharmaceutical Preparations and Chemical Products.*"

As an abbreviated title for use in correspondence, routine transactions and communications, the Council approves the following: "*The Committee on Unofficial Standards.*"

8th. The Council recommends that the Committee on Unofficial Standards devote early attention to the compilation of a list of useful recipes for druggists' use, in accordance with the communication from H. P. Hynson, Leo Eliel and Otto Raubenheimer, previously referred to the committee.

After discussion by Messrs. Asher, La Pierre, Eberle, Searby, Remington and Koch, the resolutions, as offered, were adopted.

The Secretary, on behalf of George H. Hitchcock, presented the following resolutions adopted by the New York branch of the A. Ph. A., which were subsequently referred to the committee on the Beringer question.

WHEREAS, A member of our parent organization, George M. Beringer, of Camden, N. J., was requested by a duly constituted officer of that Association to prepare and read a

paper at its Atlantic City meeting, held in 1905, on the subject, "Why the Mann Bill Should be Enacted"; and

Whereas, Mr. Beringer did prepare and read such a paper at the time and place and on the occasion mentioned, which paper was duly accepted by the Association and published in its official volume of Proceedings; and

Whereas, Mr. Beringer was sued for slander and libel as a result of his reading of the paper mentioned, and was put to great annoyance, nervous strain and expense by reason of such suit; and

Whereas, By his defense of this suit he exonerated himself, and thereby probably saved the American Pharmaceutical Association from a suit for libel for publishing his paper; and

Whereas, The said Association has never tendered to Mr. Beringer any assurance of its moral support during his legal difficulties growing out of his efforts on its behalf, or offered to share the expense incurred by him in freeing himself from these difficulties and thereby probably shielding the Association from impending troubles; now, therefore, by the New York branch of the American Pharmaceutical Association in regular meeting assembled, be it

Resolved, That we feel that Mr. Beringer was entitled to and should have received assurance of the sympathy and moral support of the American Pharmaceutical Association in his hereinbefore mentioned difficulties; and further, that we feel that the said Association is in duty bound to reimburse Mr. Beringer for the expense incurred in defending his suit; and

Resolved, That we hereby call upon the Council of the American Pharmaceutical Association to take such action as will insure justice being meted out to our fellow member, Mr. Beringer, along the lines herein indicated; and

Resolved, That the thanks of the members of the American Pharmaceutical Association and all the retail druggists of the country at large are due to The Druggists' Circular, of this city, for publishing the facts connected with the aforementioned suit and pointing out the duty of the Association to Mr. Beringer.

It was resolved that the General Secretary be directed to secure competent legal advice as to the legal responsibility, if any, of the American Pharmaceutical Association, should it officially contribute to the financial relief of G. M. Beringer in his defense of the suit against him by the Farben-fabriken.

Applicants Nos. 371 and 372 were elected members of the Association; also Leo C. Siess, of Alexandria, La., the membership and certificate having been awarded by New Orleans College of Pharmacy.

On motion of H. M. Whelpley, J. O. Burge, of Nashville, Tenn., was elected a life member on the further payment of $25.

The Chair announced the membership of the special committee of three on Membership expenses to be Messrs. Beal, Seltzer and Whelpley.

The following resolutions were submitted by J. P. Remington:

WHEREAS, The American Pharmaceutical Association has heard with great regret of the death of one of its oldest members—*Thomas Snowden Wiegand*;

Resolved, That the services of our fellow-member, extending over a period of fifty-two years, have been continuous and of great value;

Resolved, That in the death of Thomas S. Wiegand the Association has lost a true friend and one whose life was spent in serving his fellow-pharmacists.

The resolutions were adopted.

On motion of Mr. Beal, it was decided to appoint a special committee of three to take steps to secure Mexican members for the Association. The committee appointed was: Messrs. E. G. Eberle, C. A. Mayo and M. H. Hickox.

Mr. Searby made a verbal statement with reference to the report of the Committee on the Status of Pharmacists in the Army and Navy.

Adjourned to meet August 20, 1909, at 9 a. m.

J. W. ENGLAND, *Secretary of the Council.*

On motion of Mr. Searby, seconded by Mr. Meissner, the minutes of the fifth session of the Council were approved as read.

Secretary England read the minutes of the sixth session of the Council, held this day (Friday, August 20):

MINUTES OF THE SIXTH SESSION OF THE COUNCIL.

The sixth meeting of the Council for 1908–09 was held August 20, 1909, 9:30 a. m., Chairman Remington presiding

Members present: Remington, Hallberg, Caspari, Jr., Beal, Asher, Godbold, Whelpley, Bond, LaPierre, Claus, Ford, Eberle, England, Koch, Searby and Mason.

The minutes of the previous meeting were read and approved.

Applicants for membership from Nos. 373–378 inclusive were elected.

Nominations were made for certain officials of the Association for 1909–1910, as follows:

General Secretary, Charles Caspari, Jr.

Treasurer, Henry Milton Whelpley.

Reporter on Progress of Pharmacy, C. Lewis Diehl.

Nominations were closed and the nominees elected.

Nominations were made for the officials of the Council for 1909–1910, as follows:

Chairman, F. C. Godbold, H. P. Hynson.

Mr. Godbold was elected.

Vice-Chairman, J. A. Koch.

Mr. Koch was elected.

Secretary, J. W. England.

Mr. England was elected.

Mr. Godbold assumed the chair, and the first meeting of the Council for 1909–10 was organized.

Mr. Hallberg reported on the Ebert Fund. Every outstanding claim has been paid. A small amount of money is to be collected, on a rebate on lots sold last year. The balance of the fund will be $2,860.32 after the $300 has been paid for the permanent care of Mr. Ebert's grave. The jewelry on hand was valued at about $600. Two lots in the suburbs are valued at $1,000. Advice was asked of the Council as to the selling of these lots. Taxes on these would amount to $12.00 a year. A receipt for the $300 paid for care of grave was presented.

On motion, it was agreed that it was the sentiment of the Council that the lots be sold for $1,000, if this sum can be obtained.

A petition for the formation of a Pacific States Branch, signed by twenty-seven members of the A. Ph. A. from California, was presented by Mr. Searby.

The petition was granted.

A committee of three was selected to nominate the Committee on Unofficial Standards for the ensuing year, consisting of Messrs. Beal, Koch and Asher.

The report of the Historian was referred to the Council by the Section on Historical Pharmacy.

The first recommendation contained in the report was referred to a committee consisting of the General Secretary and the Historian to revise the mailing list, with power to act.

The second recommendation was laid over for consideration until next year.

The appropriation desired is contained in the Budget for 1909–10.

It was directed that the documents in the hands of the officials of the Association be turned over to the Historian as soon as, in their judgment, they cease to be necessary for their work.

Moved by Mr. Koch, and seconded by Mr. Whelpley, that a special appropriation of $150.00 be made to cover the traveling expenses of the Secretary of the Council. Action deferred until the next meeting of the Council.

The Committee on Publication was requested to inquire into the advisability of issuing a Decennial Index of the Proceedings in 1912, and to report next year. The last general index embraced volumes one to fifty and was issued in 1905.

The Committee on Finance was appointed by the Chairman of the Council, consisting of Messrs. Meissner, La Pierre and Koch.

On motion, it was agreed that the Association should rent a Safe Deposit Box for the use of the Treasurer.

On motion, it was decided that an appropriation of $60.00 be made to cover the expenses of transferring the ledger accounts of the former Treasurer to a card system and loose leaf ledger by the present Treasurer.

Adjourned to meet August 20, 1909, immediately after the final general session of the Association.

J. W ENGLAND, *Secretary of the Council.*

MINUTES OF THE ADJOURNED SESSION OF THE COUNCIL.

An adjourned meeting of the Council for 1909–10 was held August 20, 1909, at 5.30 p. m, Chairman Godbold presiding.*

The motion appropriating $150.00 to cover the traveling expenses of the Secretary of the Council (action on which had been deferred) was carried.

On motion, it was agreed that the Chairman be requested to nominate and submit for the approval of the Council nominees for the Council committees.

The Chairman appointed the following as the Auditing Committee: F. A. Uhlich, L. A. Seitz and Otto F. Claus.

Extended discussion was had upon the size and scope of the "Bulletin."

Discussed by Messrs. Hallberg, Wilbert, Rusby, England, Asher, Godbold, Meissner, and Caspari, Jr.

On motion, the Editor was instructed to continue the publication of the "Bulletin" as heretofore, but to increase the number of reading pages from time to time when, in his judgment, it seemed desirable to do so, limiting the total cost of the publication to $2,000, including the salary of the Editor.

Adjourned.

J. W. ENGLAND, *Secretary of the Council.*

Mr. Payne remarked that mention had been made in the minutes that there were no new members from the State of Georgia this year, and it afforded him pleasure to introduce Dr. Price, President of the Georgia State Association, who had made application for membership.

Mr. Osseward, of Seattle, raised the point that it was hardly proper for the Branch of the Association about to be organized on the coast to be called the "Pacific States Branch." It was too far, he said, for the pharmacists of the states of Washington and Oregon to go to California to the

* As this meeting was held after adjournment of the annual meeting, action of the Council could not be approved by the Association, but will be presented for approval at the next meeting.—GEN. SEC'Y.

meetings of such Branch, and that they expected to have a Branch at Seattle, in which event the name would probably have to be changed, and he thought it was just as well to start right in this matter.

Mr. J. P. Munson stated that the California pharmacists would have no objection to a change of the name being made.

Mr. Hallberg explained that this matter of a name for the proposed branch had come up in the Council at the morning session of that body, and after some discussion it was thought best to have the branch established in the name suggested, that of a Pacific Coast Branch, which would apply to all the states of the coast—California, Oregon, Washington, Nevada and Utah. He said that as soon as it was demonstrated that it was practicable to have a Pacific Coast Branch, and the members generally realized the advantages to be derived therefrom, then that could be split up into different branches, if necessary and three or four branches could be established. That seemed to be the sentiment in the Council when the matter was under discussion. The Chair said that, personally, he could see no objection to this.

Mr. Schneider suggested the cutting out of the word "Coast," but Mr. Searby, of San Francisco, explained that it was not to be the "Pacific Coast Branch," but "The Pacific States Branch"—that the latter was the name under which the application was made. He said that, as had already been stated by Mr. Hallberg, as soon as the Pacific States Branch had proved its right to the name and its ability to perpetuate itself, and it was found desirable to establish other branches, say at Seattle or Portland, the matter of a change of name could be taken up and dealt with.

Thereupon the Chair put the vote on the motion to adopt the minutes as read, and it carried.

The Chair stated that the next order of business would be consideration of the proposed amendments to the By-Laws, read at Tuesday morning's session. The Secretary read the amendments reported at that time to the Association from the Council, which he said required action at this time. He explained that the first was an amendment to Article V of Chapter V of the By-Laws, to strike out the figures "$5,000" in the second line and insert "$15,000" in place thereof; and also in the same article to strike out the words "two sureties or" in the fourth line, which had effect to make the Treasurer's bond secured by a trust company only, instead of making it optional to have individual bond, as heretofore. It was no longer deemed wise by the Council to accept personal security on said bond, but to take a trust company only, as had been explained by Mr. Beal on Tuesday. Mr. Searby, seconded by Mr. Wilbert, moved the adoption of these changes in the By Laws as indicated, and the motion was put to a vote and carried.

The Secretary next explained the proposed amendment to Article II of Chapter VII of the By-Laws, to strike out the last sentence of same,

which reads: "None but ex-officio members of the Council shall be eligible for re election thereto until one year after the expiration of their term of office." On motion of Mr. Claus, seconded by Mr. Wilbert, this change in the By-Laws was also adopted.

The Chair called for reports of committees as next in order, and the Secretary stated that, as to the report of the Committee on Proposed Pharmaceutical Collection at Washington, it simply gave information to the effect that little or nothing could be done until next winter, as the Assistant Secretary in charge of the National Museum at Washington was not in a position to make any provision for space at this time, but that when the National Museum is completed he would award the necessary space there. The Secretary read only the last clause of the report as submitted by Chairman Motter, quoting some words of caution from the pen of Mr. John Uri Lloyd on this subject. The full text of the report here follows:

CITY OF WASHINGTON, *August* 6, 1909.

To President Oscar Oldberg, American Pharmaceutical Association, Los Angeles, California.

Sir: On behalf of the Committee on Proposed Pharmaceutical Collection in the National Museum at Washington, I beg to report as follows:

A letter, addressed to the Assistant Secretary, Smithsonian Institution in Charge U. S. National Museum, elicited the following:

"Replying to your letter of July 14th, regarding the installation of a historical pharmaceutical collection in the new Museum building—concerning which matter, as you intimate, I have had some correspondence regarding the Hoffman and Maisch collections with Dr. Edward Kremers, of the University of Wisconsin—I beg to say that the building is not yet finished, and it is quite impossible to make any definite statement at present as to what space will be available for these collections. I regret, therefore, that it is necessary to ask you to let the matter be held in abeyance until next winter.

"As regards the establishment of a pharmaceutical library in Washington, I would also suggest that consideration of this subject be deferred until the winter.

Thanking you for your continued interest, I am,

Very respectfully yours,

(Signed), R. RATHBUN,

Assistant Secretary in Charge of National Museum."

In view of the uncertainty as to what the National Museum authorities may eventually be able to offer us, your Committee can only report progress and recommend that a Committee, with this title and function, be continued.

The individual members of the Committee have had no specific suggestions to offer with reference to the work of the Committee, though a word of caution from Professor Lloyd is herewith submitted as worthy the consideration of our successors when the Committee shall be in a position to act. Professor Lloyd says:

"As concerns the location, I maintain that the rational resting place, finally, will be in Washington. I would not like to see it made a part of the National Museum, but a part of a great work that in my opinion will some day be instituted where, as in Washington, will be the center of a mighty University concerned in subjects that include pharmacy, chemistry, medicine, botany, agricultural subjects such as entomology, etc., etc. That day, in my opinion, must come, and in my opinion, it would be a mistake to place

the Museum of this Society, irrevocably, in any location where it could not be, when opportunity presents, transferred to such an institution as I have mentioned."

Respectfully submitted, MURRAY GALT MOTTER, *Chairman.*

On motion of Mr. Wilbert, the report just read was received.

The Secretary stated that the Committee on Bulletin had a report, which had been sent to Mr. Hallberg, and also Mr. Hallberg had his own report as Editor of the "Bulletin." Mr. Hallberg said he would read his own report as Editor first, which he did:

REPORT OF THE EDITOR OF THE BULLETIN 1908–09.

CHICAGO, *Aug.* 4, 1909.

The "Bulletin" has appeared regularly on or about the first of each month during the year.

When the Membership Campaign was started about 700 extra "Bulletins" were required for mailing to prospective members each month and the number printed was increased from 3000 to 3,500, except for three months when 200 or 300 less were sufficient.

The expense it will be observed is about the same as last year and with the Editor's salary ($200) a total little less than $1,500.

The June "Bulletin" was enlarged to 48 pages, owing to the extra space required to fully report the Proceedings of the Ebert Monument Dedication.

This also permitted the publication of the Index for the year 1908, which had been deferred for the lack of space.

Some reports ordered printed in the "Bulletin" may not have appeared for the lack of space during the months when the Branches were most active; their publication later being of no avail, since they had appeared in the bound volume Report. In this connection it is suggested that the Editor be advised of any publication when such has been ordered by the Association.

With the increase in the number of Branches, the space in the "Bulletin" is becoming more inadequate, so that articles read to the Branches cannot always appear promptly in the "Bulletin" as expected.

The Committee on the "Bulletin" will report on this subject.

STATEMENT OF EXPENSES FROM SEPTEMBER 1908 TO AUGUST 1909 INCLUSIVE.

1908 September	3,000 Bulletins	$100 92
1908 October	3,000 Bulletins	106 68
1908 November	3,000 Bulletins	117 72
1908 December	3,000 Bulletins	107 08
1909 January	3,500 Bulletins	98 56
1909 February	3,500 Bulletins	115 59
1909 March	3,500 Bulletins	93 07
1909 April	3,300 Bulletins	88 71
1909 May	3,200 Bulletins	122 27
1909 June	3,500 Bulletins	141 36
1909 July	3,300 Bulletins	92 72
1909 August	3,500 Bulletins	98 71
Total		$1283 39

Respectfully submitted, C. S. N. HALLBERG, *Editor.*

Mr. Wilbert, seconded by Mr. Johnson, of Seattle, moved to accept the report as read, and the motion prevailed.

Mr. Hallberg next read the report of the Committee on "Bulletin," F. J. Wulling, Chairman.

REPORT OF COMMITTEE ON THE BULLETIN.

Your Committee on the "Bulletin" has had considerable correspondence within its membership and with the Editor during the year. With one exception, the committee and the Editor are not wholly satisfied with the "Bulletin." The efforts of the chairman were directed especially toward obtaining, first, free expression of opinions by committee members of questions submitted to them, and second, their own suggestion for the improvement of the "Bulletin"; all with a view of formulating definite recommendations to be presented to the Los Angeles meeting. The time consumed in correspondence and the delay growing out of the necessity of awaiting each member's reply to the several letters sent out, together with the diversity of views which the correspondence brought out, are among the reasons why the chairman did not call for the vote of the committee on the subjects the committee had under discussion. The chief reason, however, lies in the fact that the proposed changes are of so vital a nature that they should be discussed by the Association at large and decided by it or by the Council.

In the matter of the first proposition concerning the advisability of enlarging the "Bulletin" so as to include all the proceedings of the Association and leaving the report of the Progress of Pharmacy, and possibly the formal papers accepted by the Publication Committee, to be published in place of the present Proceedings, the sentiment is divided. Two members write that they do not believe the Association would be pleased with such a change. Others write that they believe such a change desirable. The chairman is of the latter opinion; so is the editor. If this were done the publication of the annual volume would be greatly expedited. Of course many pharmacists would not bind the "Bulletins," and the keeping in a complete form of the Association publications would not be so easily possible as under the present system of issuing a single bound volume. A member writes on this matter: "I am emphatically opposed to a 'divorce' of the two main parts of the Proceedings, *i. e.*, the Proceedings proper and the Report on the Progress of Pharmacy. I think it much better to have in one bound volume all the events of the year for reference, rather than to have one part in the annual publication and another part in a monthly publication. This would mean that both would have to be bound together by each member at the end of the year; and the fiscal year of the Proceedings is not the fiscal year of the 'Bulletin'".

In the second question of importance, the matter of advertising in the "Bulletin," the opinions expressed by the members of your committee are both negative and affirmative the negative being in the majority.

To the question, "Is it possible to make editorial comments without expressing personal opinion, if it is believed that such opinion is shared by the members?" the replies were practically unanimous that the "Bulletin" should contain editorial comment and that such comment cannot very well be made without involving the personal opinion of the commentator. A suggestion is made that in these editorial comments personalities be entirely eliminated and the style be in keeping with the dignity of our national organization. One of the members writes, "I think it entirely possible for the editor to express editorial opinions without making them personal expressions that are not shared by the Association, but there is this to remember: unless editorials have some individuality (and this embraces personality), they have little or no strength. An editor should endeavor to get all the facts possible on a question from all reliable sources, and he should then digest his findings and present reasonable and unbiased conclusions."

To the question, "Should the Council letters be reprinted in the form in which they are issued? If not, shall the Secretary of the Council be asked to furnish abstracts of them for publication in the 'Bulletin?'" the majority of the committee shares the belief that it would be better to cut down the reports of the Council letters consistently and that the Secretary of Council would be a proper person to furnish abstracts. Your Chairman, however, feels the extent of such abbreviation should be left to the Secretary of the Council and to the editor. One member of the committee writes, "Every purpose would be served, as a rule, if simply the motions and results of motions would be given. This editing should be done by the editor and not by the Secretary of the Council. The editor should use his judgment, and if necessary, present abstracts or even whole papers, if their importance requires it."

With regard to the make-up of the "Bulletin," one member writes, "The make-up of the first cover page could be improved, I think, if a form somewhat similar to the enclosed were adopted and a better display type were used. I do not like a mixture of old style extended type and Old English type in the one title. The ruled border should be omitted; the omission would make the page look much larger than at present. The titles in the editorial comments should be on the left hand side of the page and not on the right as at present, but personally, I do not care for the use of corner pieces for titles." The Chairman shares the views expressed.

The editor no doubt will report on such other matters relating to the "Bulletin" as are more specifically in his own hands.

Respectfully submitted,

FREDERICK J. WULLING, *Chairman*,
THOS. D. MCELHENIE,
J. W. ENGLAND,
C. S. N. HALLBERG, *ex-officio*.

The Chair called for action on the report just read, and on motion of Mr. Kebler, seconded by Mr. Munson, the report was received and ordered to take the usual course.

Mr. Hallberg said there was a recommendation in the report, that the Association or the Council discuss the suggestions made therein. Mr. Searby expressed the opinion that a discussion of these letters would occupy too much time at this, the last, session, and moved that the report be received and referred to the Council for consideration, and this motion was seconded by Mr. Meissner and carried.

Mr. Searby was here given an opportunity to make an announcement to the members returning homeward by way of San Francisco as to the time of departure of the train by the Southern Pacific on Sunday morning, and Mr. Godbold called attention to a garden party to be given in honor of the members at the residence of Mr. L. N. Brunswig, on Adams street, this afternoon, and urged the members to be present.

The Chair called on Mr. F. W. Meissner, as Chairman of the special committee to make proper acknowledgment of the handsome donation to the Endowment Fund made by Mr. Charles E. Dohme, of Baltimore, and Mr. Meissner presented the following:

WHEREAS our friend, Dr. Charles E. Dohme, is unable to be with us at this, the Fifty-Seventh Annual Meeting of the American Pharmaceutical Association, and

WHEREAS we realize he would have been with us in person if possible, and

WHEREAS he gives evidence of his deep interest and high regard by a contribution of one thousand dollars to the Endowment Fund created for the purpose of perpetuating this Association,

BE IT RESOLVED, that this Association sincerely regrets his absence from this meeting, his ever presence when possible being stimulating and helpful;

BE IT FURTHER RESOLVED, that we acknowledge and appreciate the veneration and spirit which actuated his contribution, and with an abiding hope that we may have him with us at our next and future meetings.

HENRY M. WHELPLEY,
JAS. H. BEAL,
F. W. MEISSNER.

On motion of Mr. Searby, these resolutions were unanimously adopted.

The Chair stated, in this connection, that the Treasurer would here make report of some additional contributions to the Endowment Fund. Treasurer Whelpley thereupon stated that contributions had been received to this Fund since the Hot Springs meeting last year as follows:

H. H. Rusby, New York	$5 00
E. J. Thurston, Grand Rapids, O	5 00
E. N. E. Klein, College Point, N. Y.	5 00
Oscar Oldberg, Chicago	25 00
J. M. Good, St. Louis	20 00
J. U. Lloyd, Cincinnati	25 00

Mr. Whelpley also stated that S. A. D. Sheppard, of Boston, and James H. Beal, of Ohio, had each contributed the sum of $26.00, being their pro rata under the agreement made, paid on the contributions of the past year.

The Chair called on Lyman F. Kebler, of Washington D. C., to present the report of the Committee on National and State Legislation, forwarded by Chairman Samuel L. Hilton. Mr. Kebler read the report as follows:

REPORT OF THE COMMITTEE ON NATIONAL AND STATE LEGISLATION.

To the Officers and Members of the American Pharmaceutical Association, Fifty-seventh Annual Meeting, Los Angeles, Cal., August, 1909:

Your Committee on National and State Legislation begs leave to submit for your consideration the following report and recommendations for the year 1909:

In looking over the Proceedings of the Association, under the heading of Standing and Special Committees, we find provision for five different committees to handle matters pertaining to legislation.

In the annual report of our honored president your attention was directed to this multiplicity of committees; we sincerely trust his recommendations will be given due consideration. We further believe that all matters pertaining to legislation could be better looked after by having fewer committees and more explicit instructions. The Section on Education and Legislation could well take care of all State legislation, while this committee should be made a Committee on National Legislation and then concentrate its efforts on legislation proposed to Congress.

In the past year the Chairman received no information or requests from pharmacists located in the States in regard to legislative matters therein, therefore it seems unwise to

continue this committee as at present, and we respectfully submit that the committee be made a Committee on National Legislation, and transfer all State legislative work to the Section on Education and Legislation, which is fully capable of taking care of this work.

Of the enormous number of bills introduced and pending before Congress of the United States the past few years, affecting every phase of the business of the pharmacist, some are good and inspired by the proper spirit to safeguard the public and should have our support and co-operation, while others are radical to the extreme, this latter class requiring close watching, and if enacted would prove very detrimental to our interests, therefore it becomes necessary for us to use all of our influence to prevent such legislation, consequently we should be well organized and prepared to meet all emergencies that may arise. The class of legislation just mentioned most frequently gives this committee the greatest concern, for the reason that of late years a disposition seems to have developed that every imaginary wrong can be controlled by legislation, and our law-makers, whom we have usually found anxious to be fair, do not realize in most cases the injustice of the various measures until their attention is called to the matter and the vital points contained therein are thoroughly dissected. We do then recommend that this committee be appointed promptly, and that the Secretary be directed to notify each member of his appointment as early as possible so that the committee can organize and carry out the instructions of the Association.

We have purposely omitted all comments pertaining to state legislation, believing that the Section on Legislation and Education will discuss this subject fully, as has been the custom.

During the sixtieth Congress, which adjourned *sine die* March 4, 1909, there were introduced in all 37,979 bills, many of which affected the pharmacist. During the last session of Congress two bills affecting our interests were enacted into law: the bill placing a tax of $1.10 per proof gallon on Porto Rican bay rum and the other prohibiting the importation of smoking opium and providing for regulations to be promulgated and enforced by the Secretary of the Treasury. These regulations are rather severe as to the importation of opium for medicinal purposes; however, we can see no reason where the legitimate use of opium will be interfered with.

The most important bills proposed, affecting the pharmacist and failing enactment, were as follows: The Parcels Post, the bill to regulate the pay and appointment of the pharmacists in the Public Health and Marine Hospital Service, the Patent Bill, and a number of bills proposing amendments to the Food and Drugs Act.

THE PARCELS POST.

Numerous bills of this character were presented, and before the Committee on Post Offices and Post Roads, of both houses of Congress, an agreement seemed impossible, although the Postmaster-General used his best endeavors to have a law enacted. During the last days of the session the Senate committee, in reporting the Post Office Appropriation Bill, reported it with an amendment, which, if it had passed, would have established an experimental parcels post on two rural routes to be selected by the Postmaster-General, under conditions and regulations to be prescribed by him, and the result thereof to be reported at the next session of Congress. This bill was reported late in the afternoon, taken up and considered, and passed the next afternoon.

To say the least this would concentrate wealth in the large mercantile centers to the decided disadvantage of the smaller cities and rural districts. The small merchants and the retail druggists located in such cities or districts, would be affected largely and their business materially decreased; realizing this and in view of the fact that the Association had previously gone on record in opposition to the Parcels Post Legislation, your Chairman with the Chairman of the Legislative Committee of the N. A. R. D. succeeded, after much work and many interviews with Senators, in having this amendment stricken from the bill.

We do therefore recommend that the Association again go on record in opposition to any Parcels Post measure and that the Committee on Legislation be instructed to use its best endeavors and all the power and influence of the Association to defeat any measure that has for its object the establishing of a Parcels Post.

THE BILL TO REGULATE THE PAY AND APPOINTMENT OF PHARMACISTS IN THE PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

This bill failed to receive any consideration by the House Committee, the Senate Committee reported a bill which passed the Senate, but failed in the House, the bill having for its object the betterment of this service. While the pharmacists were not specifically provided for, the director of the service has given assurances that the pharmacists will be properly cared for.

At the Hot Springs meeting last year, the Association went clearly on record in favor of this bill and gave assurance that it would co-operate in every way possible in obtaining the passage of the bill pending before Congress to improve the service. In view of the valuable work now being performed by this branch of the government service, under the direction of the Surgeon General, in connection with the coming revision of the U. S. Pharmacopœia, and the willingness of the head of this service to recognize any endeavor on the part of the pharmacists toward scientific attainment and thereby increased efficiency of the service, we do, therefore recommend that the Association use every reasonable endeavor to co-operate with the Surgeon General in improving the efficiency of this service and at the same time properly to look after the interests of members of our calling.

THE PATENT BILL.

The Patent Bill was not reported out of committee, your representatives attended the hearings but did not actively participate; the lack of definite instructions and the shortness of the session led us to believe that no action would be taken, and in this our surmise proved to be correct. Under treaty arrangements relating to patents, which have been made but not as yet published, we believe that many objections of the pharmacists will, at least in a measure, be corrected; if otherwise, we should be a unit in what is desired and co-operate with other organizations to obtain the best possible results. All measures of this character are necessarily compromises, consequently in making a compromise the one object, of obtaining what is best for pharmacy and pharmacists, should be paramount.

THE FOOD AND DRUGS ACT AMENDMENTS.

The principle bill to amend the Food and Drugs Act, had two objects in view: 1. The better to regulate aud control the transportation and sale of narcotic and habit forming drugs in interstate commerce, the Territories and the District of Columbia. 2. To provide a uniform label law for all poisonous substances. This bill was not reported, nor has it as yet been introduced at the special session of Congress. The first position, other than being somewhat drastic, was a good one and would have prevented much of the surreptitious traffic in narcotic drugs in interstate commerce, thus preventing the sending of such substances, to others than manufacturers, physicians, and druggists, in those States which have adopted laws preventing the sale of such drugs except on physicians' prescriptions. If some measure can be framed whereby such practices can be checked, without imposing an unnecessary burden upon those licensed by law to prescribe and handle them, we should by all means lend our support. The second proposition seems to be desirable for the reason that manufacturers conducting a large business are now compelled to label their products to conform to several different laws according to the destination of the goods. A uniform label law would obviate this difficulty and facilitate the work of the government in enforcing the Food and Drug Act. With the exception of one, other

bills pending before the committee to amend the Food and Drugs Act were not considered; the Senate Committee reported a bill to change the wording of the guarantee, which passed the Senate, but failed to receive any consideration in the House, this same bill has been introduced at the special session.

Since the convening of the sixty-first Congress, in special session, about 15,000 bills have been introduced, all of which require more or less scrutiny to determine whether any of them are detrimental to pharmacy. As no bills, other than the tariff act, the census bill, and a bill relating to Porto Rico, will be considered at the special session, ample time will elapse before Congress convenes in December for the Committee on Legislation to get in touch with all such measures.

THE TARIFF BILL.

Congress was convened in special session March 15, 1909, by the President for the purpose of revising the tariff. Much could be written on this subject, rumors of all kinds were heard, only one of which the reviewing of the stamp tax on proprietary medicines, gave us any concern. From a careful investigation, made by the Chairman at the outset, there seemed to be a possibility of putting forth such a proposition, however, the bill passed the House without such a proviso and it has not been suggested in the Senate; fortunately the pharmacist will not have this additional burden to bear. From a careful examination of the tariff bill just passed in comparison with the Dingley Act, the retail pharmacist will have no cause for complaint; for necessities the majority of the changes are downward, while luxuries, such as imported perfumes, soaps, etc., are advanced; as the consumer of this class of products can well afford to pay the advance, there is no reason for complaint.

Naturally the agitation of tariff revision tends to create a feeling of unrest, and as a consequence business has been more or less depressed. We feel that as soon as the new law is in complete working order a change for the better will be apparent.

THE INTERNAL REVENUE RULINGS.

The position of the Internal Revenue Department in regard to the classification of so-called medicinal compounds, made and consumed solely for beverage purposes, is to be commended. The position of the department is clear, and the sooner the pharmacist divorces from his business the sale of intoxicating liquors and the above-named compounds the better it will be for him and for American pharmacy. We should be pharmacists, not rum sellers conducting speakeasies under the guise of a pharmacy.

We therefore recommend that the following resolutions be endorsed, that the Commissioner of Internal Revenue receive the thanks of this Association for the action he has taken, and that a copy of the resolutions, if agreed to, be forwarded to him by the Secretary:

"*Resolved*, That the sale of intoxicating liquors, whether simple or compounded, for beverage purposes should be entirely divorced from the practice of pharmacy, and that it is the duty of members of the American Pharmaceutical Association to give their efforts to the accomplishment of this end.

"*Resolved, further*, That we recognize the propriety and justice of such proper regulative measures as may be necessary to prevent the surreptitious sale of alcoholic liquids for beverage purposes under the disguise of medicinal or pharmaceutical compounds, and that the members of the American Pharmaceutical Association do hereby give their aid and support toward the enactment and enforcement of all just laws for this purpose."

The recent radical changes, in the old regulations governing the sale of viruses, serums, toxines and analogous products, that have been made in the new regulations, just promulgated by the government board of officers having supervision over the matter, should meet with approval and the American Pharmaceutical Association, should endorse all movements that will give the sick purer and better medicinal products.

SUMMARY OF RECOMMENDATIONS.

1. The changing of the name of the committee to the Committee on National Legislation, and transferring all State legislative matters to the Section on Education and Legislation.

2. That all Parcels Post Measures continue to receive our vigorous opposition.

3. That work for the raising of the efficiency, status and pay of the pharmacists in the government service be continued and every effort made to obtain the recognition the pharmacists deserve.

4. That the Patent Laws be amended so that a foreigner will receive no more advantages in this country than a citizen of the United States may receive in the respective foreign countries.

5. That our support be given to any amendment to the Food and Drugs Act that will not place an unnecessary burden on the pharmacist, yet at the same time better control the transportation and sale of all narcotic drugs and prevent their getting into the hands of persons not licensed to prescribe and dispense them.

6. That we heartily commend the work now being performed by the Internal Revenue Department, in divorcing from legitimate pharmacy the sale of alcoholic beverages and so-called medicinal compounds that can be used as beverages.

7. As this Association, since its organization, has always favored the elevation of standards for medicinal products, we therefor recommend the endorsement of the improvements made in the regulations governing the sale of viruses, serums, toxines and analogous products.

In conclusion, the Chairman desires to extend his most sincere thanks to the members of the committee for their co-operation and assistance during the past year, and the committee wishes to thank the officers and members of the Association for the confidence and trust placed in them to look faithfully after the Association's interests and to carry out its wishes.

In completing the year's work and reporting the result thereof, we wish to say that we have used our best endeavors to perform properly the responsible task imposed upon us, we have given the best we are capable of, and trust this report will meet with your approval.

Respectfully submitted, S. L. HILTON, *Chairman.*

Mr. Wilbert moved that the report be accepted and that the recommendations in it be adopted. This motion was seconded by Mr. Munson and Mr. Schmidt.

Mr. Rusby moved as an amendment to the motion made that the Association should not adopt that portion of the report which would put this body on record as opposed to the establishment of a parcels post law. He said he knew he was in a hopeless minority and he did not think he would get many votes for his motion, but he always liked to go on record. He said he believed that while the establishment of a parcels post would be detrimental in some ways to some pharmacists and business men, he thought the profession of pharmacy and other professions should not stand for the passage of laws that favored them to the disadvantage of the American people at large. Personally he believed the people of the country should have a parcels post law, the same as they have in other countries, and he had felt all along that the position of the pharmacists of the country in opposing this measure was not a generous one to the public at large.

Mr. Rusby's view of this matter was seconded by Mr. Holzhauer, of New Jersey, who said he thought pharmacists should be in favor of the greatest good to the greatest number, even if it interfered with their own business to some extent. He said he thought they ought to be intelligent enough and public-spirited enough not to place themselves in opposition to a measure that was destined to prove, as he thought, of such great good to the people of this country.

Mr. Searby took sharp issue with Mr. Rusby and Mr. Holzhauer upon the proposition of a parcels post bill. As an illustration of the evil of a parcels post law and other centralizing influences he cited the case of the city of London, which now has a population of some seven millions of people. Fifty years ago, he said, many of the towns of Great Britain were of about the same size they are now, whereas the city of London then only had a population of somewhere in the neighborhood of two millions. A parcels post system there had largely contributed to the centralization of business in the great metropolis of the country, and he predicted that it would have a similar effect in this country. He stood for the welfare and development of the small towns of the land as opposed to a few great cities which would be the distributing points for the whole country. He himself had a home not far from a small country town, and he had observed that little country town grow to double and even treble its population since he had known it. In that little town could be had most of the things necessary for the people who live in the vicinity. The farmers could get a very large proportion of their supplies in that little city, and he held it to be to the interest of the farmer having produce to sell that he should have a small town within a few miles of him where he could dispose of his products. A parcels post law would deplete these little towns, as had been the case in England, where many of the smaller cities are less in population than they were fifty years ago. He said that it was to the interest of California to have a large number of prosperous towns rather than that the whole business of the State should be done by the cities of San Francisco and Los Angeles. He, too, believed in considering the greatest good to the greatest number, but he believed this end would be accomplished by placing as near to the people of a community as possible the comforts and luxuries and advantages of the great centers of trade and population. England was not the only country, he said, where, in the smaller towns, you could buy hardly anything. This condition was more pronounced in Germany than in England, and in neither of these countries can one buy the comforts and necessities of life in the smaller towns as in this country. The farmer wants a market where he can go and buy things near home, without having to send 3,000 miles for his supplies. Mr. Searby went on to describe how, two or three times a year, the big catalogues of the great department stores in the cities, with their attractive illustrations and still more seductive prices, enter the homes

of the people and lure them to send their money to these great centers for many things that might just as well be bought at home. He cited the case of the boy who finds a 65-cent fishing-rod advertised that appeals to him; then the girl finds farther along something she desires, and the mother still farther along something that she imagines she wants, the result being that an order for six or seven dollars' worth of stuff will be made up and sent off, all started by that 65-cent fishing-rod, to the decided disadvantage of local dealers. He said that a druggist in San Francisco who had a branch postoffice had told him that twenty-five per cent. of the money orders issued by him were sent to mail-order houses in Chicago and New York. The average man has little conception of the extent to which this practice prevails. His idea was to distribute the money and wealth of the country and let everybody have something, rather than that the big mail-order houses, with their enormous capitalization and facilities, should gobble up everything in sight. He admitted that there were some advantages in the parcels post idea, but held that they were far less than the disadvantages and injury resulting.

Mr. N. A. L. Cody also spoke briefly in opposition to a parcels-post law, and said that in the little town of 2,500 or 2,600 population where he lived these mail-order catalogues were a fruitful source of money being sent out of the town to Chicago and other centers, a loss that was felt by the local trade.

Mr. J. H. Flint also endorsed Mr. Searby's position, and did not think the greatest good for the greatest number meant the centralization of the business in the large cities.

There were calls of "Question!" and the Chair put the vote on Mr. Rusby's amendment to eliminate that part of the resolutions relating to parcels-post, and the amendment was lost by a heavy vote.

The Chair thereupon put to the vote Mr. Wilbert's motion to accept the report and adopt the recommendations as made, and the motion prevailed.

Mr. Hallberg moved that the Committee on National Legislation be instructed to use every endeavor to have a bill passed by Congress empowering the Interstate Commerce Commission to regulate the express charges of the country. He said that was the nub of this whole situation. The express charges to-day are twice as much as they were twenty years ago, and the people of this country are entitled to a reduction in these charges. He claimed that with a reasonable reduction in the express charges there would be no need of a parcels-post law. This motion was seconded by Mr. Munson and others.

Mr. Remington said he was very glad to have Mr. Hallberg bring that question up. He thought that was the *crux* of the whole situation. He hoped the American Pharmaceutical Association would join in the general movement taking place in all the large cities everywhere to reduce the outrageous express charges the people have to pay.

Mr. Rusby forcibly remarked that if the idea was to defeat all parcels-post legislation, so as to prevent the distribution of merchandise from the large centers, the proper thing for the Association to do was to try to get the express charges fixed at four or five times the figure they are to-day, so as to put a complete stop to this business. The greatest good to the greatest number, it seemed to him, would apply to the hundreds of thousands of customers in this country, and not to the dealers.

The Chair then put the vote on the Hallberg motion, and it carried unanimously.

The Chair called for the report of the Committee on Patents and Trade-Marks, and Mr. Meissner, of that committee, said that while the report was somewhat lengthy, it was no longer than the importance of the subject-matter deserved. However, there was other business of importance to come up, and he would simply abstract the report "down to the bone." This he proceeded to do, the full text of the report being as follows:

REPORT OF THE COMMITTEE ON PATENTS AND TRADEMARKS.

Your Committee on Patents and Trademarks submits the following as its report:

To reconcentrate the thought of the Association upon the importance of our Patent and Trademark laws as they relate to medicine, and especially the construction that has been and is being placed upon these laws, we invite attention to the following facts:

The Constitution of the United States declares it to be the object of the patent law to promote progress in Science and the useful arts. If properly applied to the practice of the pharmacologic arts (pharmacognosy, pharmacy, pharmaco-dynamics and therapy-dynamics) the Patent Law would promote progress in the science of pharmacology. Pharmacology or the science of Materia Medica, being a branch of medical science, and the *practice* of pharmacology, a branch of medical *practice*, the obligations of the medical and pharmaceutical professions to the science and practice of pharmacology are unmistakable.

The practice of medicine and of pharmacy require medical and pharmaceutical education, and educational institutions are indispensable for the proper teaching of pharmacology and the pharmacologic arts. Common standards for determining the character, quality and strength of materia medica products must of necessity be provided, and the Patent Law as applied to pharmacology must be in conformity with educational requirements, otherwise the law can not attain its object.

In furtherance of the welfare of the American people and in justice to those who serve them in the important matter of protecting the health of the people, the practice of medicine and of pharmacy ought to be limited to licensed practitioners duly qualified by education and training. Certainly the Patent Law should be so administered as not to protect unqualified practitioners in carrying on a commercial business in materia medica products in competition with licensed practitioners. Especially is this true where the methods employed are not in conformity with proper educational requirements.

Consideration of the foregoing prompts the asking of these questions:

1. Is the present Patent Law in conformity with the needs of the people, evidenced by the fact that it adequately safeguards and encourages the professions upon which the people rely for protection against, and the healing of, disease?

2. Is the Patent Law now interpreted and administered in conformity with the needs of the people?

In answer to the first question, attention is directed to the fact that, in contradistinction to our own, a very large number of foreign countries exclude materia medica products from patent protection yet permit the granting of patents upon processes and machinery for their manufacture.

This limitation has been established because materia medica products can not be properly introduced to science except by means of investigations made by a number of persons engaged in the practice of the pharmacologic arts and whose environments are widely different. Their investigations being co-operative in nature are properly common property. The granting of *product* patents which enable the introducers of new materia medica products to prevent the marketing of these products by all but themselves virtually brings about control by the monopolists of such co-operative work as is done with any given product, thereby defeating the ends of professional pharmacy. The natural result of this system is to make the existence of a *profession* of pharmacy impossible.

Again, this commercial control means the converting of the pharmacologic arts into a great advertising bureau for the introduction of materia medica products, or else it means a checking of progress through excluding new materia medica products, under their proper or generic name, from proper consideration by the professional institutions of learning, by the professional societies, local, state and national, and by the medical and pharmaceutical press.

The Patent Law of the United States permits the patenting of products as well as of processes. The product thereby comes under the control of commercial houses which conduct their business on commercial lines. The principal method employed by them for the introduction of new materia medica products is advertising. The advertisements are published in the medical and pharmaceutical journals and constitute a very important part of the income of these journals. To make this expensive advertising profitable it is necessary that these commercial houses enjoy a monopoly of the sales of the products advertised, otherwise competition would prevent their charging prices high enough to warrant the customary enormous outlay for advertising purposes.

It is alleged, and there appear to be good reasons for believing that the charge is not without foundation, that the ultimate aim of many proprietary medicine manufacturers is to use the medical and pharmaceutical professions as stepping-stones for the introduction of their products to the lay public. In this way their commercial business is substituted for legitimate medical and pharmaceutical practice. These houses are very bitter against retail druggists for indulging in what they term "fraudulent substitution;" but if the charge we have mentioned is true it would be difficult indeed to find a more flagrant case of fraudulent substitution than this.

The Supreme Court of the United States, in the California Fig Syrup Case, recognizes the importance of limiting the practice of medicine and pharmacy to persons who have been suitably educated and have obtained a license from the Board of Examiners. Said the Court:

"It would seem to be inconsistent and to defeat such salutary laws if medical preparations, often and usually containing powerful and poisonous drugs, are permitted to be widely advertised and sold to all who are willing to purchase. Laws might properly be passed limiting and controlling such traffic by restraining retail dealers from selling such medical preparations except when prescribed by regular medical practitioners."

The second question, namely, "Is the Patent Law now interpreted and administered in conformity with the needs of the people," may be answered by saying that the lower courts do not always interpret the Patent Law in accordance with its evident object or in conformity with the principles laid down by the Supreme Court. Indeed, it not in-

frequently happens that the decisions rendered protect, to a degree which it is difficult to understand, the interests of manufacturers who are conducting their business in competition with the medical and pharmaceutical professions, and in direct opposition to the welfare of the public.

This brings us to a consideration of the important question, "How can the Patent Law be modified and administered in such ways as to accomplish the object for which it is intended, as outlined in the Constitution of the United States?" In other words, "How can the law be modified and administered so as to promote progress in materia medica science and practice?"

First, as to the desirable modifications of the law. The German Patent Law excepts from patent protection the following:

"(1) Inventions the application of which is contrary to the laws or to public morals.

"(2) Inventions relating to articles of food, whether for nourishment or for enjoyment, and medicines, as also substances prepared by chemical processes in so far as the inventions do not relate to a definite process for the preparation thereof."

"Sec. 35..... If the invention relates to a process for the production of a new substance, all substances of like nature are considered as having been made by the patented process until proof to the contrary is given."

These exceptions seem to your committee eminently proper, and if the patent laws of the United States can be so modified as to make similar exceptions, the pharmaceutical and chemical arts would be adequately protected. In this event, new materia medica products could be introduced by means of the educational machinery of the professions, and brands of the products could be brought into commerce by means of advertising that would be unquestionably legitimate.

Chloroform, for example, is a materia medica product. Its manufacture has always been open to competition, yet the patented *processes* employed enabled the manufacturers to sufficiently protect their prices. Of the five American patents granted within the last thirty years upon processes and machinery for manufacturing chloroform, three have already expired, the fourth (that of Ottokar Porsch of Orangeburg, N. Y., assigned to the Eclectic Chemical Co. of New York City) expiring in 1913, and the fifth (that of Albert W. Smith of Cleveland, Ohio) expiring in 1921. Progress in science is not in any way hindered by patents of this sort, because chloroform itself has ever been free to science and, being free, its properties as an anesthetic have been, under all circumstances, impartially discussed without fear or favor.

Closely related to this subject of suitably rewarding the discoverers and inventors of new processes is the question of trade-marks as applied to materia medica products. It is assumed by the introducers into commerce of proprietary medicines that they possess the right to prevent others from copying their so-called inventions or from using the names they have coined for materia medica products. They claim that an inventor possesses a natural right to his inventions, and that the names given his products are inventions. They also claim that these names are copyrighted. Again, they assert that their coined names are trade-marks. The facts are:

1. An inventor does not possess a natural right to prevent others from copying his invention, but such right, when it exists at all, is a matter of grant and subject to the conditions imposed by the statutes. The statutes are known as *patent laws*, and the grants secured to inventors by the statutes are *patents*.

2. The Librarian of Congress has issued an official circular in which the statement is made that coined names are not subjects for copyrights. Discussion of this phase of the subject is therefore unnecessary.

3. As stated in the report of the Commissioners appointed by Congress, in 1898, to revise the statutes relating to Patents, Trade and Other Marks, and Trade and Commercial Names:

"The adoption of a trademark or device to indicate the manufacture or origin of a certain article does not give any right to the exclusive production of the article so marked. Any article of manufacture, unless it be protected by patent, may be made and sold by any person. There is no such thing as an exclusive right to any particular branch of industry. The only restriction is that each party shall stand upon its own merits, and none shall be permitted, by the use of marks or symbols, to pretend that the goods offered by him are the products of another..... "This rule has even been applied to cases where there was no intentional deception, as where the manufacturer of steel was prohibited from stamping upon his manufacture certain words which he supposed were descriptive of a particular quality of steel, but which were, in fact, the name of the original manufacturer and indicated his ownership."

4. As stated by the Court in the case of Leclanche Battery Co. vs. Western Electric Co., "When an article is made that was theretofore unknown it must be christened with a name by which it can be recognized and dealt in, and the name thus given it becomes public property, and all who deal in the article have a right to designate it by the name by which alone it is recognizable."

Furthermore, as stated by Browne on Trademarks, "the policy that the mere use of a name to designate an article would give to those employing it the exclusive right to designate such article by such name, would be giving a copyright of the most odious kind, without references to the utility of the application or the length of the title, and one that would be perpetual. Neither the Trade-Mark Law, nor the Copyright Law, nor the Patent Law, affords any such right or, under the pretense of the same, allows any one to throttle trade under the alleged sanction of law."

In this connection your committee calls attention to the statement made by the members of the House Committee on Patents in 1896, Hon. Benj. Butterworth, chairman, as follows:

"The registration of an alleged trademark does not make it valid. Registration is merely to give notice that the thing registered is claimed as a trademark. The validity of the claim can only be settled by the courts.

"The use of a trademark in no wise restricts the free use by others of the article of merchandise to which it is affixed. It confers on the user no privilege to the exclusive use of an invention of the kind conferred by the Patent Law, otherwise we should have the anomaly of laws diametrically opposing one another. The Patent Law grants the inventor the exclusive use of his invention for a limited time, and then only on the publication of exact knowledge of the invention whereby the public may manufacture it when the patent expires. The use of a trademark, on the contrary, is unlimited in duration, and no publication is required when it is used on an invention.

"The public has a perfect right to manufacture and sell any article of commerce not patented, and to do so under its proper or generic name, whether a trademark is used in connection with the article or not. For this reason the courts hold that names describing the article can not be used as trademarks on the articles they describe. Otherwise the use of trademarks would be a hindrance to competition, while the proper use of trademarks promotes competition by distinguishing between one brand of an article and another brand of the same article, thus stimulating manufacturers to improvement in processes and methods of manufacture for the purpose of excelling each other in producing the same articles of a better quality or at a lower price.

"While not constituting itself an interpreter of law, yet the House Committee of Patents as individuals did not hesitate to affirm the position above described, and so instructed the Associated Press reporter present."

From the above it is clearly evident that there is no justification for the existence of the proprietary medicine system that has grown up in our country. But it does not follow that the proper use of a trade-mark is not of the greatest value in protecting the

public against fraudulent substitution. Not only so, but the right use of trade-marks insures both protection and encouragement to legitimate commerce.

When a name is coined by one who *uses* it as a trade mark upon a particular article, the user should be protected in the exclusive use of such a name for the purpose of distinguishing *his brand* of the article from other brands of the same article. But the article itself must have a name and an identity of its own before the name claimed as a trade-mark can exercise its function of pointing out the origin or the ownership of the brand.

For example, the name quinine cannot properly be a trade-mark of quinine. The ownership of the name quinine by the original introducer of this product would have forced competitors to coin new names for the article, so that we would have had as many names for quinine as of manufacturers who made it.

Nothing is more clearly evident than that the proprietary medicine system is a hindrance to progress in science and the useful arts. It is protective of secrecy and often of fraud. It throws its mantle around the quack medicine business, thus becoming responsible to no small degree for its sins and giving it a quasi legal status to which it is in no way entitled. Last, but far from least, it prevents the proper standardization of materia medica products and their adoption by the Pharmacopœia.

Finally, it is assumed by the proprietary medicine manufacturers that their products being secret in composition or in process of manufacture, the introduction of similar products by competitors is a system of fraudulent substitution. An excellent answer to this assumption is the following quotation from "The Law of Trade-Marks," by D. M. Kerly, published in 1894 by Sweet & Maxwell:

"The name of a secret preparation may be used by any one for goods actually prepared according to the recipe, for they are the goods indicated by the name, whether prepared by the original inventor of the recipe, or his successor in business, or not. Until the secret is discovered or betrayed the goods of the original inventor or his successors can be the only goods to which the name is applicable, or which are denoted by it; but when other people can make them, the question of fact arises, whether the name is merely that of the goods themselves, or that of the goods of the kind prepared or sold by the original inventor or his successors in business. This was well put by Fry, J., in the Angostura Bitters case (Siegert *vs.* Findlater, 7 C. D., p. 813). 'I cannot say,' the learned judge said, 'that Meinherd may not, if he can, make a bitter identical with the plaintiffs', and if he does, I cannot prevent him from selling it as Angostura Bitters.' It is to be observed that the person who produces a new article, and is the sole maker of it, has the greatest difficulty (if it is not an impossibility) in claiming the name of that article as his own, because until somebody else produces the same article there is nothing to distinguish it from. No distinction can arise from using the name of the class so long as the class consists of only one species, for then the name of the species and the name of the class will be the same."

The conclusion of your committee is that the American Pharmaceutical Association should again declare its disapproval of monopoly of materia medica products, whether monopoly is secured by means of patents on products or by registration of names that are used as titles for products of secret composition. It should persistently declare its opposition to secrecy regarding the source of products of preparations or any other method that hinders progress in the science of materia medica.

Recognizing, however, the necessity of protecting capital invested in the legitimate chemical and pharmaceutical industries, we approve the patenting of processes and of apparatus for manufacturing medicine, but we do not approve of extending the patents to the product. We also approve of the registration of trade names for brands of products, to be used in connection with the generic or identifying names of these products provided formulas are published whereby the products may be duplicated by those skilled

in the art, for otherwise there is danger that the art of preparing them may be lost to medical science, the interests of the public suffering in consequence.

By expressing our disapproval of patented materia medica products and the registration of materia medica names as trademarks, and by endorsing process patents and the employment of brand names to distinguish between brands of the same materia medica product, we are reaffirming the position taken by the Association at its meeting in 1897. We refer to the "Preamble and Resolutions" presented by the Committee of the American Pharmaceutical Association to the American Medical Association at its Philadelphia meeting in June, 1897, and subsequently read by the Committee to the American Pharmaceutical Association meeting in August of that year.

In relation to trademarks we heartily endorse the conclusion reached by the Committee on Patents and Trademarks of the American Medical Association in its report to the Atlantic City meeting of that Association in June, 1909, as follows:

"In regard to the evils arising from the registration of names as trademarks . . . these evils are to be remedied by the courts rather than the enactment of new laws." Your committee finds nothing in the Trademark Law to which it objects, but it opposes any interpretation of the law that fosters monopoly by protecting manufacturers who are using as trademarks the titles of their products.

The committee mentioned further recommend to the American Medical Association: "In view of the great importance of obtaining judicial opinions on these and other questions arising in the practice of registering trade names of medicines, we recommend that the Committee on Patents and Trademarks consider the advisability of trying to secure such opinions, and in the event such action seems desirable it shall be empowered to proceed by and with the advice and consent of the trustees."

The recommendations quoted were concurred in by the House of Delegates of the American Medical Association, the committee being "continued for another year." In reference to the proposition to limit patents, as they relate to medicinal articles, to processes of manufacture, this American Medical Association Committee in the report referred to said:

"In the event that patents on products as distinguished from patents on the process by which the products are manufactured were done away with, the difficulties under our system of law of proving affirmatively the use by the alleged infringer of the patented process are so great that the value of process patents would be practically destroyed. The presumption obtains generally under our system that proof of guilt or of the infringement must always be made by the person alleging it rather than that the accused must first establish his innocence. It is comparatively a simple matter to prove infringement of a mechanical patent, because a machine can be seen, described and its mechanical functions easily understood, but in the case of chemical processes practically the only way of proving the use of any patented process is by the evidence of a man who has actually performed it. The result is that to prove an infringement of a process patent it is usually necessary for the plaintiff either to subsidize some of the alleged infringer's employees or to put confederates in his factory, neither of which is commendable. . . . We therefore conclude that such a change in the patent laws is impracticable."

Your committee does not agree that the proposed alteration in our laws, whereby patents relating to medicinal substances shall be upon processes only, is impossible of accomplishment, and we are unwilling that the American Pharmaceutical Association shall desist from its efforts to bring about this desirable change because the science and practice of pharmacology urgently demand for their advancement that monopoly in materia medica products shall cease. However, we fully recognize the seriousness of the difficulties to be surmounted and it seems unwise to lengthen this report by entering upon a discussion complete enough to place the whole subject fairly before the Association.

A committee of the Pennsylvania Pharmaceutical Association has also considered the

subject of Trade-Marks and Patents during the past year and your committee is much gratified at the renewed interest that is being manifested generally in reference to this important subject.

Inasmuch as the American Pharmaceutical Association has, through years of labor, created the sentiment that has led to the activity and interest which is now quite generally manifest and must, in justice to its mission, continue in the front ranks of those who are toiling on behalf of progress in the science and art of pharmacology, we recommend that the Committee on Patents and Trade-Marks be continued and that it be instructed to co-operate as effectively as possible with the representatives of other organizations for the correction of the present unsatisfactory conditions relative to our Trade-Mark and Patent laws and the construction placed upon them.

Respectfully submitted,

FRANKLIN M. APPLE,
F. W. MEISSNER,
FRED. M. SCHMIDT,
F. E. STEWART,
THOS. V. WOOTEN, *Chairman.*

The Chair stated that action would be deferred on this report until Mr. Meissner had time to bring in some resolutions that he proposed to offer.

The Chair called on the Committee on Time and Place of Next Meeting to make its report, the Chairman Engstrom presented the following:

REPORT OF COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

August 20, 1909.

To the American Pharmaceutical Association:

Your Committee on Time and Place of the Next Meeting, 1910, beg leave to report as follows:

The Time: After carefully consulting the interests of members, we unanimously recommend the time of meeting to be immediately after the close of the U. S. P. Convention, which will be held at Washington, D. C., commencing May 10, 1910.

The Place: We have received letters of invitation from the following:

Atlantic City, N. J., from Atlantic City Publicity Bureau.
Cedar Point, Ohio, from The Cedar Point Resort Co.
Mobile, Ala., from Battle House Hotel.
Chattanooga, Tenn., Chamber of Commerce.
New Orleans, La., The Mayor, Martin Behrman.
New Orleans, La., Progressive Union.
Rochester, N. Y., the Mayor, H. H. Edgerton.
Rochester, N. Y., Chamber of Commerce.
Saratoga Springs, N. Y., Chas. F. Fish, and other druggists.
Saratoga Springs, N. Y., Publicity Commission.
Put-in-Bay Island, Ohio, Hotel Victory.
Washington, D. C., Washington Board of Trade.
Richmond, Va., Chamber of Commerce.
Richmond, Va., T. A. Miller, a member of our committee, and Secretary Board of Pharmacy.

The committee recommends that the next annual meeting of the Association be held at Richmond, Va.

Respectfully submitted,

ERNST O. ENGSTROM, *Chairman.*

Mr. Payne moved the adoption of the report as read, and Mr. Wilbert seconded the motion.

The Chair suggested that the committee recommend that the next meeting of the Association be held in Richmond, Virginia, and called for remarks.

Mr. Hallberg asked if the Hotel Jefferson, at Richmond had been rebuilt since the fire which partially destroyed it some years ago, and the Chair said he thought it had.

The Chair then proceeded to put the vote on the report of the committee naming Richmond as the next place of meeting, and it was carried unanimously, and the Chair declared that Richmond had been selected as the next place of meeting.

Mr. H. B. Mason here offered as apropos to this time and place, the following resolutions:

WHEREAS, The members, delegates and invited guests of the American Pharmaceutical Association have been most hospitably and bountifully entertained by the druggists and citizens of Los Angeles during the time of our fifty-seventh annual meeting; be it therefore

Resolved, That we tender to the pharmacists, the Chamber of Commerce, and the citizens of Los Angeles our heartiest thanks for their unstinted hospitality in entertaining us, and we hereby desire to express as fully as we can our grateful appreciation of all their attentions and arrangements for our comfort and enjoyment.

We also desire to record a special vote of thanks to the local Secretary, Thos. W. Jones and the members of his various committees, as well as to Mrs. Fletcher Howard and her associates of the ladies' auxiliary, for the excellent arrangements made, which contributed so much to the success of the meeting.

We desire further to express our thanks to the druggists of Pasadena for the extremely hospitable and generous manner in which we were shown about that beautiful city and dined at the Hotel Guirinaldo.

We would also further convey our thanks to the druggists of Long Beach for their splendid entertainment at the Hotel Virginia, and to the Traveling Mens' Auxiliary for the delightful smoker tendered the members of our Association at Levy's Cafe on the evening of August 19th.

To the daily press of Los Angeles we are greatly indebted for the unusually full and correct reports of our proceedings, and it is entitled to our gratitude.

Mr. Munson seconded the resolutions just offered, which were put to a vote and carried unanimously.

Mr. Remington here asked if the report of the Committee on Time and Place had been adopted, and the Chair answered in the negative, saying that the vote had been put on the locality, but not on the time. Mr. Remington then moved to adopt the report as a whole, and Mr. Wilbert and Mr. Meissner seconded this motion.

Mr. Hallberg called attention to the fact that the date of the meeting had not been set, and moved that the date be fixed for Monday, May 16, 1910, the meeting to continue to Friday the 20th, inclusive. Mr. Eng-

strom, chairman of the committee, said this would be entirely agreeable to the committee; that they did not know how long the deliberations of the Pharmacopœia Convention would last, and that was the reason they had not specified any date. Mr. Remington thought this could be easily done by simply inserting it in the report, and it was so understood.

Thereupon the motion to adopt the report of the committee was put to a vote and carried, and the Chair said this included the fixing of the date as moved by Mr. Hallberg.

Mr. Berger, of Florida, said that he had endeavored to get in a word before Mr. Mason introduced his resolution of thanks, and before this matter was disposed of. He said his idea was, that there was no use in inviting the Association to any other point but to Richmond for 1910, but he wanted to invite the Association for the following next year (1911) to Florida—to meet in Tampa. He said they had all the facilities for taking care of the Association there, and there was no other place in the world that would remind the members so forcibly of the present very pleasant place of meeting, as they had the same climate, the same flowers, etc., as at Los Angeles.

Mr. Meissner here stated that the report of the Committee on Patents and Trade-Marks had made some suggestion, but made no specific recommendations. Thereupon Mr. Wilbert moved that the report of the Committee on Patents and Trade-Marks of the American Pharmaceutical Association be received, and that the committee be continued; that the report be printed in the "Bulletin," and also in the Proceedings of the Association, and that the local branches be requested to consider this subject the coming winter, and submit such suggestions as they might see fit to this committee, and that this committee at the next annual meeting of this Association submit specific recommendations for a line of action in this matter. This motion was seconded by Mr. Hallberg and carried.

The Secretary announced that there were two or three communications that might be read at this time. He said that by direction of the Association he had sent a telegram to President Oldberg early in the meeting, and had received a reply this afternoon which he thought the members would like to hear:

"Your kind greetings heartily appreciated. May your meetings be fruitful."
(Signed) OSCAR OLDBERG.

The Secretary stated that the date of this message was Chicago, August 20th—this morning. The other communication, he said, was from a valued lady member of the Association, who desired to express her best wishes to the Association. He read the following:

MINNEAPOLIS, MINN., *Monday, Aug. 16, 1909.*

American Pharmaceutical Association, Los Angeles, Calif., Care of Hotel Alexandria.

My best wishes to the American Pharmaceutical Association on its fifty-seventh year. May its new year produce its *best fruit.*

JOSIE A. WANOUS.

The Secretary also stated that he had several communications from druggists in other parts of the country, one of them signed by fifteen or twenty druggists of Mt. Vernon, Illinois, congratulating the Association upon its meeting in California, and wishing it success at this meeting.

The Secretary further called attention to some resolutions coming from the Scientific Section, to instruct the delegates of this Association to the Pharmacopœial Revision Convention to be elected later on at this meeting to move for the introduction of tetanus antitoxin in the next Pharmacopœia. This matter, he said, had been deferred for action until this afternoon. Mr. Hallberg suggested that inasmuch as the Association had not undertaken to instruct these delegates on any other subject pertaining to the Pharmacopœia, he saw no reason why an exception should be made in this particular instance; that it seemed to him that the desired end would be subserved by referring this request to the Committee of the Association, which was already committed to the introduction of these agents. He therefore moved that the resolutions be referred to the Committee on United States Pharmacopœia of this Association. This motion was seconded by Mr. Rusby and carried.

The Secretary asked if there were any other communications or requests from any of the Sections, so that nothing of this sort might be overlooked: This was the time to bring them up. There was no response to this inquiry.

The Secretary stated that the Reporter to the Public Press desired to make a short verbal statement. Thereupon Mr. F. B. Hays, chairman of said committee, made verbal report to the effect that when he reached the city of Los Angeles he found that the Local Secretary had made arrangements with the public press, both local and by telegraph, to make reports of the meeting. He said the reporter had put himself in touch with the representatives of the local press to a large extent, but he found he could do very little, as the Local Secretary and Mr. Peairs had already taken the matter in hand. He said the press of the city had given the Association very liberal space, more particularly the "Times." He found that the "Express" had also given a number of good photographs, and the "Examiner" and "Herald" had also been quite liberal in their treatment of the Association. The Association was under obligations to these gentlemen—"we do not know how much, or how much good the Association had done them in turn." He concluded by saying that he thought the Association should express its appreciation of the courtesy shown by the press. Mr. Mason seconded this motion and it was adopted.

The Chair called attention to the fact that the report of the Committee on Status of Pharmacists in the Government Service had been referred to the Council for the omission of certain language which was considered possibly a little too strong, and the Council had taken action thereon and the report had come back to the Association with these eliminations. Mr.

Rusby thereupon moved to adopt the report as submitted, and this motion was seconded by Mr. Asher and carried. The amended report is as follows:

REPORT OF COMMITTEE ON THE STATUS OF PHARMACISTS IN THE GOVERNMENT SERVICE.

Your Committee on the Status of Pharmacists in the Government Service submits the following report:

No legislation of any kind affecting the pharmacists in the government service was enacted during the past year. Though several bills affecting the status of pharmacists were pending during the sixtieth Congress, none have reached the floor of either branch of this Congress.

As far as this committee can learn, no officer of the government has made any effort to relieve the position of the pharmacists employed in the government service, regardless of the fact that the pharmacists of to-day are graduated from the same institutions of learning as other professions, with a degree upon the same platform and with the same measure of honor as other professions, which the government has honored with commissions, at the present time pharmacists are still appointed in the same manner as persons holding positions which require no special training.

The Senate Committee in its report on the Senate Bill 6101, which had for its object promoting the efficiency of the Public Health and Marine Hospital Service, and which only applied to physicians employed in that service, accepted the contention of the promoters of this bill and made it a part of their report that the efficiency of this service would be improved by giving the physicians a standing of more honor. Your committee did not oppose the theory of the Senate Committee, but agreed with the latter that it would promote the efficiency of the service, but that it would apply with equal force to the pharmacists as well as to the physicians employed in the same service. Your Chairman wrote to the head of the Public Health and Marine Hospital Service a letter along this line, but never received any reply.

The Chairman of this committee thinks the Convention at Hot Springs made a mistake in not endorsing a different plan to follow or a method to proceed upon. The Chairman also does not feel that it is necessary to wait for the head of a department to suggest changes in existing conditions for he believes as an American citizen that it is not only a duty but a vested right of any American citizen or body of citizens to petition a department of Congress asking them to correct any wrong or give to any one whether employed by the Government or not the right that justly and honestly belongs to him. This bill to promote the efficiency of the Public Health and Marine Hospital Service passed the Senate but failed in the House.

Another bill known as the H. R. 16091 to fix the pay and standing of the pharmacists in the Public Health and Marine Hospital Service was drawn up and presented by a committee from the National Association of Retail Druggists during the first session of the sixtieth Congress which succeeded in getting a hearing on the bill and an adjournment for a second hearing which never came in spite of the committee's request for the adjourned hearing.

Bills to promote the pharmacists in both the army and navy were introduced into the last Congress but never became laws.

A bill has already been drawn up and placed in the hands of a Congressman to be introduced in the sixty-first Congress, similar to H. R. 16091, but more explicit in its details.

This committee recommends that the convention instruct its committee to urge Congress to pass some measure to improve the position of the pharmacists in the Govern-

ment service and also that the President and Cabinet Officers whose department employs pharmacists be petitioned to use their best endeavors to correct the existing evil.

W. S. RICHARDSON, *Chairman.*

The Chair stated that the time had now arrived for the installation of the new officers of the Association, and that immediately after adjournment there would be a meeting of the Council, and all the new members of the Council, together with the old ones, were earnestly requested to remain for that meeting, as business of importance was to be transacted. He then called upon Messrs. J. P. Remington and John Uri Lloyd to escort the President-elect, Mr. Henry H. Rusby, of New York, to the chair. These gentlemen performed this very agreeable office and conducted Mr. Rusby to the rostrum, where Vice-President Eberle introduced him to the convention and pinned the badge of office on him.

Mr. Rusby said: "Friends, on an occasion like this, I think that any man might well be pardoned for indulging the temptation towards individual retrospection. It is true that the presiding officer over a body like this ought to sink all personal considerations in the welfare of the Association; but we are human and cannot do it. And so I want to tell you that this is one of the proudest moments of my life, to become the President of an association like the American Pharmaceutical Association. My mind goes back to the time when I sat on a wooden bench in a little district school, a little bare-foot boy. I heard the teacher of that school engage in some work which I thought was very wrongfully done, and I remember to-day as plainly as though it was yesterday how I straightened up, with my heart aflame, and thought that if ever I was a school-teacher I would do that thus and so. And then I fell back into my seat, overwhelmed with shame that I had indulged the thought of the possibility of ever reaching the position of teacher of a village school. And so when I joined this Association, on the nomination of our dear old friend, Peter W. Bedford, I simply joined it intending to perform an humble part in the work. But as always where one joins an association with the intention to work, the work increases. Work faithfully performed brought more work. That brought responsibility. But I pledge you my word that I never thought of the possibility of such a thing as being President of this organization until my friends in New York suggested it about one year ago, and even then it seemed to me a wild idea. But here I am to-day taking charge of one of the greatest works that is going on in this or any other country. I made a statement in the Council yesterday that I think I may repeat here, that there is nothing higher in this world in the line of pharmacy, in my opinion, than the American Pharmaceutical Association. You get perhaps greater learning in Germany and perhaps greater ethical *eclat* in England; but if you take the common sense and progressive spirit of the American people, I cannot help but believe that American pharmacy stands ahead. And yet we of this Association stand here to-day looking

toward the future of pharmacy in this country just as our predecessors fifty years ago looked forward to what we have attained to-day. We are never satisfied, but forever going onward. That is why I feel so proud of being President of this Association, and especially at this time, for there never was a time of greater activity in the development of both professional and commercial pharmacy than the day in which we are living. Another thing that gives me special pleasure is the fact that I am the first President to be elected by the ballot of all the members of the Association. You are all familiar with the change. The President used to be elected by those present at the meeting, but recently a change has been made, so that now three persons are nominated, and a ballot is sent out and taken. By a difference so slight that it is only to be considered as purely an accident, I came out ahead, with the least little bit of a margin—with not more than a thumb and finger-full more votes than my dear friend Eberle here [Applause], who this year has been our presiding officer, owing to an unfortunate and sad accident; and yet it is an accident mixed with pleasure that we can have him here with us.

"Now I did intend to say more on this occasion, but the hour is late. I do want to say this however: That it is given to every man to have certain individual characteristics, and he is a sensible man who recognizes his own characteristics and travels along that line, and tries to do the best he can, be it a little better or a little worse than what somebody else can do. My line is professionalism. I love everything relating to pharmacy and its welfare; but my particular line turns upon professional pharmacy."

Mr. Rusby then proceeded to make an appeal to the representative men of the National Association of Retail Druggists and the National Wholesale Druggists' Association to uphold the professional side of pharmacy, and not be altogether commercial men. In conclusion he pledged the Association that every personal consideration should be put aside for the time being, and he would work for the good of the American Pharmaceutical Association during the coming year to the best of his ability. (Great and continued applause.)

Mr. Rusby here took the chair, and said he regretted that the First Vice-President-elect, Mr. C. B. Lowe, of Philadelphia, was absent, as was also the Third Vice-President-elect, Mr. William B. Day, of Chicago. The Second Vice-President-elect, Mr. Charles W. Johnson, of Seattle, was present, however, and he requested the same committee to escort the gentleman to the rostrum. While the committee was engaged in this pleasant office, the Chair told the story of General Havelock, of the British Army, who was a man so gentle that it seemed as if he would not fight, and his fellow-officers, when he went to India, concluded that he was a weakling, and on one occasion when he had been grossly insulted by a bully, they got together and held a sort of indignation meeting and agreed that something must be done. So they selected a committee to

wait on the General the next morning and inform him of their attitude in the matter. The committee proceeded to carry out its instructions in due course of time, and they wanted to know of General Havelock what he proposed to do about it. The response was, "I have done it." "Done what," they said? "I shot him this morning before breakfast!" And so here in the person of Mr. Johnson was a quiet unassuming gentleman, who had conducted one of the greatest fights for the welfare of pharmacy ever undertaken in the northwest; "and he will be a fighter for this Association," said Mr. Rusby.

Mr. Johnson was greeted with applause as he came forward and said: "Mr. Chairman and friends of the Association, it certainly gives me pleasure to be selected as the Second Vice-President of this body. I do not anticipate any very great onerous duties connected with the office, since the President and First Vice-President seem to be healthy and able-bodied men." Mr. Johnson then went on to say that he felt as though his election was due probably to the fact that his name happened to head the list of three candidates submitted to be voted upon, and that those who did not know them simply voted the first name they came to. He said he would endeavor to do well any work that might come to his hands, and that he was better at working than he was at talking about it.

The next officer to be installed was a "novice" at that sort of things, so the Chairman said. He referred to the Treasurer-elect, Mr. H. M. Whelpley, of St. Louis.

Mr. Whelpley was greeted with hearty applause as he came forward to speak. He began by saying that in his early manhood he had promised himself that insofar as possible he would follow a vocation that would offer him pleasant occupation, and would avoid those things that were burdensome—that were not pleasant to him. He said that he got pleasure, and sometimes even recreation, out of his work. It was in view of this resolve and life-long principle that he had hesitated at the Hot Springs meeting last year to accept the office of Treasurer to which he had been elected, for he had wondered whether he would find the work burdensome or interesting. He also feared that he might not be competent to carry out the work. But one year of the Association work had gone by since then, and he could say that the duties of the office had afforded him far more interest and pleasure than he had anticipated. The matter of competency was yet to be fully determined, but he thought that he was gradually working into the office. Mr. Whelpley commented upon the fact that the bond of the Treasurer had been increased at this meeting, and facetiously remarked that he didn't know whether it was on account of the fact that the members had come to know the Treasurer better or not. (Laughter.) He unselfishly expressed the hope, however, that the business of the Association during the next year would justify a still further increase of the bond of the Treasurer. He particularly thanked the members of the As-

sociation for their co-operation in a most necessary work of the Treasurer, that of collecting dues. The mere reading of the list of delinquent members at this meeting had resulted in the striking of five names from the list and the saving of those members to the Association, which of course was very gratifying. He expressed his appreciation of the honor and confidence implied in his re-election to the office of Treasurer, and said he would endeavor to co-operate with the able staff of officers that had been selected for the ensuing year.

The Chair said that the services of so able an officer as Mr. Whelpley deserved something more than mere thanks, and that the members could greatly increase the pleasure and satisfaction he had referred to as attaching to his office by coming forward promptly with their dues, since there was nothing that pleased a Treasurer more than to see the money coming in.

The Chair next called on the General Secretary-elect, Mr. Chas. Caspari, Jr., of Baltimore, to address the Association.

Mr. Caspari said he wanted to express in a few terse words his sincere appreciation of the continued confidence of the members of the Association. He said that when he reached the city of Los Angeles on Sunday evening and entered the Alexandria Hotel, he was met with a reception warmer than any he had ever received before. He did not know how he had stood the ordeal, but it was certainly a delightful sensation to have such a mark of favor from those he had been trying for years to serve. Due to the unfortunate death of Prof. Maisch, he had been placed in the office of Secretary sixteen years ago, and had striven ever since to do his modicum of work along that line. He assured the members that he would endeavor to do his duty in the future as he had in the past, and if his efforts met with their approval he would be satisfied.

The Chair next called on Mr. F. C. Godbold—"a splendid name," he said, "that of a man bold in the name of God and in the work of this Association"—to address the members as the new Chairman of the Council.

Mr. Godbold said that he could not understand why he had been elected Chairman of the Council, and certainly it was not on account of his speech-making ability, as that was something he could never do. He promised to do everything in his power to advance the interests of the Association.

The Chair next called upon Mr. Jos. W. England, of Philadelphia, as Secretary-elect of the Council.

Mr. England reminded the members that brevity was the soul of wit, and especially when the hour was late. He simply wished to say that he felt most keenly the honor implied in his re-election to the office of Secretary of the Council, and begged to assure the members that he would endeavor to do his duty in the future as he had tried to do it in the past.

Retiring First Vice-President Eberle here took occasion to state that he would feel dissatisfied with himself if he did not express his sincere thanks to the members for the consideration shown him during the days that he had presided over this meeting. He said he certainly appreciated it, and thanked the members for the honor they had conferred upon hin.

Mr. Hallberg stated that he did not know that there had been any vote of thanks extended to retiring officers, or that it was necessary, but he certainly thought a vote of thanks was due to First Vice-President Eberle, who had so well presided over the sessions of the Association, and had expedited the work in such a splendid way, and he moved such vote accordingly. He said that mingled with feelings of regret at the enforced absence of the President during the sittings of the Association, he thought there could well be associated the pleasure of having had Mr. Eberle preside. Mr. Payne, of Georgia, heartily seconded this motion, and moved that it be adopted by a rising vote. The Chair so put the vote, and it carried unanimously, amid the applause of the members.

President Rusby stated that it was not his purpose at the present time to indicate all his committee appointments, because it took time for their careful selection. There were two committees, however, that it was necessary to appoint now, on account of the early meeting of the Association to which they would be accredited, namely: The Delegates to the National Association of Retail Druggists and those to the National Wholesale Druggists' Association. He named the following as a delegation to the N. A. R. D. meeting at Louisville, beginning September 6: As Chairman, C. Lewis Diehl, of Louisville; William J. Schieffelin, of New York; John Bond, of Little Rock, Arkansas; Frank H. Carter, of Indianapolis; and E. Berger, Tampa, Florida. As Delegates to the National Wholesale Druggists' Association the following: Dr. H. W. Wiley, of Washington, D. C.; Edward Kremers, of Madison, Wis.; A. B. Lyons, of Detroit, Mich.; Charles M. Ford, of Denver, Colo.; S. L. Bresler, of Denver, Colo.

President Rusby said he was in doubt upon one proposition that he would like to ask the advice of the members concerning, and that was as to the continuing of three special committees of the Association. He said he did not propose to indicate that there was any reason why these committees should not be continued, but some question had been raised as to whether it was necessary. The first was the Committee on Publicity, which had made a report at this meeting to the effect that conditions were such that they had found it impossible to accomplish anything of consequence, and he understood from their report that they thought it was better that the committee should be discontinued. The next was the Committee on the Relations of the A. Ph. A. to the N. A. R. D. These two associations, he said, understood each other fully, and each was accustomed to send delegates to the meeting of the other. The third committee was that on Drug Reform. The Association had a Committee

on Pharmacopœia, and also a standing committee on Drug Market, and he thought perhaps the Association would agree that these two committees could very well occupy this field and do the necessary work, and that there would be no necessity of retaining the Committee on Drug Reform. He suggested that if any member desired to see any one or all of these committees retained that he would make a motion to that effect.

Thereupon Mr. Wilbert moved that the Committee on Drug Reform be continued. He explained that this was a drug committee of the American Pharmaceutical Association, and not the American Medical Association. It was instituted at the request of Doctor McCormack. He considered that there were great possibilities before this committee, and that the fact that the committee did not have an opportunity to do much work last year was not necessarily an indication that it might not do so in the future. This motion was seconded by Mr. Hallberg and others and carried.

President Rusby said that the next order of business was the selection of delegates to the Pharmacopœia Convention. He confessed that, as that matter only came around once in ten years, he was not familiar with the line of procedure, and asked information of some of the older members as to how these names were to be selected. He said there were five delegates to be appointed or elected. Mr. Remington stated that he believed these delegates were generally appointed by the President, and he would suggest that as there was no particular hurry about it he should do this at his leisure. The President responded that he was thankful to Mr. Remington for this information, and he would exercise very great care in the selection, as it was one of the most important things that the Association had to do. He also said he would take the advice of as many of the members as he could counsel with.

General Secretary Caspari reported no further business on his table.

President Rusby said that it might seem superfluous for him to say anything more than had already been said about the splendid entertainment that had been accorded the visiting members in the city of Los Angeles, but he could not refrain from giving a personal expression. He said that he had never seen anything like it before; that not only had the amount of money spent upon the entertainment of the visitors been great—that was a small matter, relatively—but that the spirit of true hospitality exhibited by their hosts, and their watchful care to anticipate every want of their guests, must especially appeal to all. He said that when his daughter came home the evening before and told him how she had been entertained by the ladies, he thought that he ought especially to speak of the work the ladies of the local committee had done at this meeting, and it was a pleasure to him to tender his sincere thanks and hearty appreciation for what these ladies had done.

Mr. Payne, of Georgia, seconding the words of the President, hand-

somely remarked that when the members came to California they expected to find a city full of angels at Los Angeles, but in addition to that they had found a whole State full.

The Chair stated that as there was no further business to come before the Association, a motion to adjourn would be in order.

Thereupon Mr. Cook, of New York, seconded by Mr. Asher, of New Orleans so moved, and the Association stood adjourned *sine die*.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST SESSION—TUESDAY AFTERNOON, AUGUST 17, 1909.

Chairman H. B. Mason, of Detroit, called the first session of the Section on Commercial Interests to order at 3:15 p. m. Secretary E. H. Ladish, of Chicago, was present and acting, as was also W. M. Bowman, of Toledo, one of the Associates on the Committee.

Chairman Mason asked Mr. Bowman to take the Chair, while he read his address:

THE CHAIRMAN'S ADDRESS.

The Section on Commercial Interests of this Association has had a troublesome existence. Its paternity has often been regretted. It has usually been treated, indeed, as an illegitimate son, and it has even been denied the curious fascination and interest which sometimes attaches to such offspring. It has been tolerated with easy-going charity when not treated with cold indifference and neglect. The ultra professional and scientific devotees among us walk by on the other side of the street and ignore the family connection. Every year or two some one proposes to throw the unwelcome son out of the house and lock the door after him for fear that he may by some chance return and take his modest seat in the corner.

Two or three times, indeed, the Commercial Section has had to fight for its existence. Once a proposal nearly carried to combine it with the Section on Practical Pharmacy and Dispensing—an ingenious proposal which would practically have meant the destruction of the Commercial Section as such, and which would also have crippled the one other Section in this Association that appeals most to the practical druggist and should therefore receive hearty and enthusiastic encouragement.

I hope these efforts to kill or stultify the Commercial Section will cease. I would like to see the American Pharmaceutical Association devote as much care and feel as much interest in the Commercial Section as in any other department of its work. There are two reasons why it should do so.

In the first place let me remind you that of late years the Association is making heroic efforts to increase its membership and extend its influence. It is putting forth every effort to enlist the interest and gain the support of the rank and file of retail druggists throughout the country. Did it ever occur to the Association that these men will not come into the fold unless they are attracted by work done in their behalf? Is it realized that there is a widespread notion among druggists that the A. Ph. A. is a scientific and professional body which has no concern for the retail drug business; that the trans-

actions are above the head of the average man; that the membership is made up of specialists, experts, and investigators of various kinds; and that the retailer has nothing to gain and money and time to lose by joining our ranks?

Is this realized? It ought to be. It is only too true that such a conception of the A. Ph. A. is prevalent all over the country, and that hundreds of druggists who actually are members never come near our meetings and only continue their affiliation from an honorable feeling that they ought at least to lend their nominal support to an Association which has done so much for the professional, scientific, legislative, and educational welfare of the calling.

I do not need to argue that this is highly unfortunate. We may reply that it is unjust; I believe it is in large measure; I have myself fought it time and time again in print and out of it; but the fact nevertheless remains and we must reckon with it. It ought to be clear to all of us that if we desire to grow in strength and influence, and if we are anxious to increase and retain our membership, we must do work which will appeal to the retail druggists of the country. We must more properly represent them. We must provide them with a meeting ground. We must make them feel that the American Pharmaceutical Association is *their* Association. Where can this end be so well achieved as in the Section on Commercial Interests and the Section on Practical Pharmacy? Both of these Sections should be given the fullest encouragement. Both should be developed to the uttermost of their possibilities.

The second reason why the Commercial Section should be so treated is really an amplification of the first. It is the proud boast of the A. Ph. A. that it is the one broad, cosmopolitan association which represents American pharmacy in every department and feature of its life. Among its members are manufacturers, jobbers and retailers; teachers and editors; chemists and investigators; board of pharmacy members; government and state officials; pure food and drug commissioners. The A. Ph. A. is a great clearing house for these various representatives. It is a sort of Pharmaceutical Congress with delegates from every branch and offshoot of the calling; and it is largely because of its wide and thoroughly representative character that the Association has been able to do so much for the development of American pharmacy in all its departments.

Now it can scarcely be denied that a cosmopolitan association of this sort should give as much attention to the commercial as to the scientific phases of the calling it represents. The drug business of to-day is as much a trade as a profession; it is both; and fully 50 per cent., if not more, of its interests are purely commercial. If the Association desires—and I am sure it does—to reflect pharmacy as it actually exists, it should then devote equal attention to commercial and professional activities. If it does anything else, it is to that extent failing in its mission to serve the calling with breadth and sympathy.

The retailer is the foundation of the whole structure. Upon him is reared everything else—wholesaler, manufacturer, investigator. His interests are paramount. His welfare should receive our first and our most hearty consideration.

Pharmacy is to-day faced by a condition and not a theory. So far as we are idealists we may keep our eyes fastened on the theory only, but so far as we are practical men looking for the achievement of attainable ends, we must recognize conditions as they exist and make the most of them. The pharmacist of this generation is absolutely compelled to put in side-line after side-line in order to make a living. He finds it necessary to practice modern business methods if he would successfully hold his own in the fierce competition of the time. These are facts, and it is worse than folly to blink them. If the retailer would succeed in his calling it is more important that he should be a good business man than that he should be a thoroughly trained pharmacist. Don't let us put the cart before the horse. We shall not travel at a very rapid pace with the natural order of things reversed.

I have felt for years that our colleges of pharmacy are failing to fulfill their destiny in so far as they deny commercial subjects their proper place in the curriculum. A technical school ought to fit men for the conditions which will confront them after graduation. This I regard as self-evident and indisputable. If, then, the pharmacist is 50 or 60 per cent. a business man, his college should give him something like this percentage of instruction in business methods. Conditions have changed during the last 25 or 30 years; the colleges of pharmacy have not fully adjusted themselves to these changes; and in my judgment they are falling considerably short of their mission in life for this reason.

I would remind you that the whole scheme of university instruction has been greatly modified during the last generation or two. It has slowly adapted itself to the economic changes of the country. It has endeavored to supply the needs of a nation whose dominant note is commercial growth and expansion. The university courses of to-day are much less classical and far more practical than they were 30 or even 10 years ago. Most of the leading universities, indeed, are now conducting commercial courses—courses which are far removed from the mere elementary instruction in book-keeping and the like provided in the so-called "business colleges." So marked has this evolution been that one of the university presidents of the old school bitterly resented it in a public address delivered not many months ago, but the tendency of the time is against him and the movement will continue.

Reverting to the question of developing greatly the study of commercial subjects in our colleges of pharmacy, I have not the space to dwell on the theme here or to anticipate and meet the objections of critics. I must confess that nearly every pharmaceutical teacher with whom I have talked has scouted the idea, but I have heard no arguments which have caused me to change my views. Furthermore, I dare predict—predictions are safe, because people forget them before they are either realized or falsified—I dare predict that in 25 years from now we shall find our colleges of pharmacy devoting far more time and care than they do at the present time to commercial subjects, with less attention perhaps to certain of the higher branches of the scientific studies. While ten or more colleges have already made a tentative start in this direction, they have little more than scratched the surface and their courses are elementary and incomplete.

The average druggist of to-day is not enough of a business man. Either consciously or unconciously he clings to the tradition that he is a professional man who does not need to be schooled in business methods, and I am sorry to say that both the A. Ph. A. and the colleges have not only done little or nothing to dispel this illusion, but for the most part have fostered and perpetuated it. The future will see a change. It is bound to see it. Competition is growing steadily keener in all branches of trade and in every profession. Druggists are no exception to the rule. If they are to hold their heads above water, if they are to survive and succeed, they must be better and ever better business men and merchants. No truth is clearer to me than this, and it has been forced home after a close observation of the drug business as conducted in most of the leading cities of the country.

The druggist of the future must abandon the loose business methods which have satisfied him in the past. He must know how to practice business economies. He must avail himself of his cash discounts. He must watch his book accounts with creditors. He must make prompt collections. He must prevent the accumulation of dead stock. He must so manage and conduct his business as to get the most out of it in every detail. He must understand the laws of trade and the peculiarities of the purchasing public. He must buy wisely, sell aggressively and advertise skilfully. He must take annual inventories; he must know his percentage of expense; he must understand his percentage of profit; and he must realize whether a given transaction yields him returns or causes him an actual loss.

The large and successful druggists, the men who have built up profitable establishments, know and understand these things thoroughly, and if the average man expects to hold his own in competition against them, he must practice their methods, and take several leaves out of their book of experience.

This Commercial Section of the A. Ph. A. can do excellent work in these directions. It can help the druggist in his desire to become a better business man. It can serve as a clearing house for ideas and methods evolved by shrewd pharmacists here and there throughout the country. It can be in a limited sense a sort of post-graduate school of business practice just as the Association as a whole has so successfully been a post-graduate school of scientific and professional pharmacy.

Cherishing these views, holding firmly to these truths, the chairman offers no apology for the very practical and possibly non-professional character of some of the contributions presented to the Commercial Section this year, and he regrets only that at the last minute he failed in his efforts to secure from first-class men three or four additional papers on assigned subjects which would have been of unusual value to the business druggist.

The address just read was heartily applauded.

The Chair said he thought all would agree that Mr. Mason had brought out some very good points, points particularly interesting to the members of this Section. He invited discussion on the paper.

Mr. Valentine Schmidt opened the discussion by saying that, during the last twenty years, he had been in a great many drug stores in California, and had conversed with a great many more proprietors, and to his great surprise he had found that inventories were practically unknown, as was likewise such a thing as careful supervision of stock, while careless buying seemed to be the rule. He said he would like to see this address of the Chairman published and sent to every druggist in the state of California.

Mr. Ladish, of Chicago, said he thought the Chairman had presented an unusual paper, that part particularly relating to adding to the curricula of schools of pharmacy some business training—such as profits. An article on this subject had come before his State Association, and was tabled after considerable interesting discussion. He agreed that some such course should be added to the curricula of the colleges and pushed, and this was the right time for it. "You teach your young man all these scientific things," he said, "and when he comes into the store he has practically got to be taught these things that the schools are not paying attention to." He was not criticizing the schools, but he thought they could add to their student-rolls by making this addition to their curricula. He thought it was vital that no time be lost in doing this. One or two of the schools had told him they were going to do it. This would make it a great deal easier for the student, and he would come to his business far better equipped to go behind the counter and take care of his own.

Mr. Charles Caspari, Jr., said that, representing as he did one of the schools mentioned in the Chairman's valuable address, he took great pleasure in saying that this little plant had taken root in a number of institutions already, and it looked as if it would be successful. In eight or

ten schools a more or less extensive course is given now in commercial training, not only ethical but practical; and as to the school he represented, they had examinations in their ethical training. His school was among the first three to adopt this system of commercial-pharmacy training. They had found it valuable and the students had found it profitable, as shown by the fact that students must stand an examination in commercial training as well as in scientific work, which shows this to be a move in the right direction. He predicted that within the next few years a large number of the principal schools would give a course in commercial training.

Mr. Francis Hemm said he represented a school in the West, and was also here to speak from the standpoint of the retail pharmacist, and desired especially to speak on one point that the Chairman had brought out —one that should never be lost sight of. He commended the Chairman for the candid manner in which he had come forward and stated the facts. There was no getting away from the fact that, in this country, the pharmacist is at least fifty per cent. business man and the rest professional man, and all the State Associations are from year to year voicing this sentiment. The Missouri Association has every year put itself on record as being in favor of the commercial side of pharmacy being properly fostered and promoted by our schools of pharmacy. Two years ago, on the strength of one of these resolutions, the St. Louis College of Pharmacy, to which he was attached, made a test and introduced a chair of Commercial Pharmacy, and the results had been most gratifying. This course had become popular with both students and teachers, and the experiment was very encouraging. "If," said Mr. Hemm, "we are to make a success of pharmacy in this country, and a success of the American Pharmaceutical Association, we must certainly teach our young men how to make a practical living, and how to conduct their pharmacies in a business-like manner." Referring to the statement made that invoices in drug-stores are unheard of in many cases, he thought that many pharmacists were bad buyers and poor bookkeepers—that they were frequently poor business men—and the same care should be taken to teach the best business methods as to teach students how to test certain preparations, how to make them and preserve them, and how to safely dispense medicines. Of course, he said, the American Pharmaceutical Association would always, first and foremost, make it its duty to advance the scientific end of pharmacy. This is a scientific body, and the more professional work it can get the pharmacist to do the better for him. But for the present, and until that ideal should be changed for which professional pharmacists have striven for so many years, he, as a teacher of pharmacy, and as a retail pharmacist, wanted to go on record as favoring the proposition that this Section of the American Pharmaceutical Association should be encouraged on all sides, and particularly by the schools of pharmacy.

Mr. C. Osseward expressed his agreement with the position taken on this important matter. He had had experience in his city in trying to get new members of this Association, and the answer always was, "Oh, that is nothing but a scientific body! What is the use of going down there?" He believed that this was one of the sections that should be made attractive to the every-day pharmacist. He said he had as much use for the commercial side of the business in his own store as he would have in a general store; and he had solved that problem by having as his partner a man of practical business knowledge, who attended to that end of the business, while he gave his attention to the prescription business.

Mr. R. A. Lyman said he was much pleased with Mr. Mason's address, and thought it was a fair specimen of the good common sense that usually flowed from his pen. However, he represented the school of pharmacy in the University of Nebraska, and when it came to adding a course in commercial pharmacy to the curricula of the schools, "we are up against a practical difficulty," he said. Theoretically, it was a beautiful thing, and he realized the justice of the statements made by Mr. Mason; at the same time it would be impossible in his school, and he believed it would be impossible in every school in the country, to cut down or take out one-half of the present scientific instruction given. He thought this course should be added to the schools, but it must be gradually done, and the length of the course must be increased; for to cut off half of the present course of two or three years and devote it to commercial training would be impossible. This is a practical question, and if commercial work is added to any extent in the schools, they must increase the number of years required of students in the study of pharmacy.

The Chair suggested that he thought the gentleman had misunderstood Mr. Mason: that he had said the pharmacist was fifty per cent. a business man and fifty per cent. professional man, but he did not think he meant that fifty per cent. of the course in colleges of pharmacy should be devoted to commercial training, but that a reasonable amount of commercial training would be all that was necessary. Mr. Bowman himself thought that fifty per cent. of commercial training might be all right on the outside, but that was not practicable in the schools of pharmacy.

Mr. Mason explained that the Chairman had misunderstood his point. He did mean to say that, in practice, the pharmacist was at least fifty per cent. a business man, and that the colleges must approximate that percentage of commercial training in their courses of instruction. He said he was familiar with the answer made by the gentleman from Nebraska, which did seem more or less convincing. He did not know that he could offer any suggestion as to how the colleges were to meet this demand beyond cutting down some of the scientific work that had heretofore been deemed necessary. He was as much a stickler for scientific as for commercial pharmacy; the sole point was, that commercial pharmacy was just

as deserving of recognition as scientific pharmacy, and ought to be given an equal opportunity in the colleges of pharmacy. Perhaps the colleges would have to make the course three years; and in his judgment this would have to be done sooner or later, if they were to educate the student to the demands of the business as it existed.

Mr. Albert Schneider, speaking for the California College of Pharmacy, said they had given some attention to commercial pharmacy. Two or three of their lecturers on commercial pharmacy were in the room now. They were very capable, and gave some interesting and instructive lectures. It was simply out of the question, however, to divide the college course equally between commercial and scientific study. He was certain if Mr. Mason had ever thought much on the subject he would say so himself. Furthermore, where would be the dividing line?—where begin to teach the commercial side? Would they begin with the sale of "bicycles, cigars and baby-carriages," or where would the dividing line be? He thought this would be a difficult question to solve.

Mr. Ladish, of Chicago, said the idea was not to teach the students how sell a bicycle, but how to sell a tooth-brush. He did not think the Chairman (Mr. Mason) meant exactly what he said about a fifty per cent. course of instruction in commercial pharmacy—although it might come to that in time. The idea was to teach something about salesmanship, about courtesy to customers. "Many young men," he said, "are imbued with the great big notion that they measure forty-six inches around the chest, when they only measure thirty-six." If the schools would give them instruction in a few practical points it would be a great help, and perhaps not more than two hours a week would be necessary for that purpose. He thought it desirable to have a competent man speak to them on the necessity of advertising and how to advertise. It would not be at all necessary to give fifty per cent. of the course to this work; a tremendous work could be done by devoting ten per cent. to it.

Mr. E. L. Baldwin considered this a very important subject. He especially thought students should be taught how to treat people properly. This was one of the hardest tasks he had, to impress this lesson on the young men who came into his store. What is wanted is true salesmanship. Another thing the colleges should teach is common honesty. He gave a number of illustrations to show the necessity of this. The boys should be taught they must be square with everybody, and square with themselves. He commended the idea of giving more attention to this subject in the schools of pharmacy.

Mr. Mason suggested that there was a great deal of business to come before the Section this afternoon, and some things more important than the Chairman's address. He wanted to make this suggestion, however, as to the difficulty of adjusting the course in the colleges to accommodate commercial instruction. The universities have not found difficulty in

making that adjustment. They used to think it was necessary to keep up their old classical studies in Greek and Latin and the higher branches, and not longer than sixty years ago they had practically nothing else. To-day we find them dividing the course between classical and practical instruction, so that in a four-years' course in the universities of Wisconsin and Michigan, for instance, not more than fifty per cent. of the time will be given to classical work. How do they do it? Simply by cutting out a lot of material formerly thought necessary. They have cut these things out in order to give way to things of more practical importance.

Mr. Hallberg said he thought all of the schools were endeavoring more or less to be in touch with the present tendency on this subject. He considered the average college professor as decidedly impracticable, however, when it comes to teaching the student about these things. For example, he himself tells his students when they have a store not to put their rubber goods in the window, where they will be injured by the action of the sun upon them. The average business druggist will stack them up in his window, but that is not the place for them. If he were running a retail pharmacy, he would have a nice little card somewhere in the store showing how rubber goods are injured by putting them in the sun. They should be kept in a cool place, and of course must be properly brought to the attention of customers, but not in the way of window-display.

Mr. R. A. Leet said he would not want a better demonstration than the remarks of the last speaker to show the impracticability of a course in commercial training in the colleges of pharmacy. He agreed that rubber goods should not be placed in the window—that is, if the purpose was *not* to sell them. As a matter of fact, it was money in the pocket of the average druggist to make window-displays of these things, even if the particular article was afterwards thrown away—pitched out of the window. This is far preferable to keeping the whole stock secreted away somewhere. It don't pay to put rubber goods in the window so far as the goods put in the window are concerned, but it does pay so far as the stock on hand for sale is concerned. Window-dressing and display pay better than any other kind of exploiting of goods. It even pays to display prescriptions once in a while. He did not think any of those present would care to take pills or capsules after they had been displayed in a window, but it was nevertheless advantageous to make such displays. Mr. Leet said he had been called upon by the California College once or twice a year to talk on the commercial side of pharmacy, and he was more and more convinced that the amount of such instruction that could be profitably given within the walls of the college was limited. He thought this question had been largely taken care of, anyway, in the provision that the student must have spent a certain period of time in a store where prescriptions are compounded; and he believed that, in the last analysis, it would depend on the individual himself as to his commercial fitness, and not on the schools

of pharmacy. If such training is had in the colleges, it must be through very careful and competent men, because it is just such points as this that are frequently brought up, where the scientific side is apparently in conflict with the commercial side of the business. Some things should be given very serious thought under the head of commercial pharmacy in the colleges, and perhaps it would be a wise thing to introduce such a course as far as possible, but in the end it depends on the individual.

Mr. Mason again suggested that other business be taken up, as a number of these subjects would come up for discussion later, in connection with other papers.

Mr. Mason thereupon resumed the chair and called for the reports of committees as the next order of business.

Mr. Wilbert said that at the meeting at Hot Springs last year a special committee had been appointed to consider certain matter turned over by Mr. C. Lewis Diehl, of Louisville, and that he had been made chairman of said committee. The committee had duly considered and abstracted this mass of matter, after consultation with Mr. Diehl, who was also a member of the committee, and the results of their labor had been turned over to the editor of the "Bulletin," and part of it had been published: it was not thought wise to embody it in the Proceedings. The Chair stated that, unless objection was made, the papers would take the usual course, and it was so ordered.

The Chair said that it was the rule not to read papers where the authors were not present, but he would like to make an exception to the rule in one or two cases, on account of the peculiar nature and value of the papers submitted. He said the first paper he desired to call attention to was a very interesting symposium on the subject of a druggist's mailing list, to which some five or six well-known members of the Association had contributed, and he would ask the Secretary to read it. Secretary Ladish then read the following:

THE DRUGGIST'S MAILING LIST: A SYMPOSIUM.

Lewis Flemer, Washington, D. C.: We have several mailing lists, obtained principally from the city and telephone directories, the latter being especially useful when lists of physicians or certain classes of business men are desired.

Our physicians' list is divided into two classes: one which we call "preferred," containing about 375 names of the more active and prominent regular practitioners, the other, the general list, embracing the names of all physicians of the city without regard to the size of their practice or to their particular school of medicine. These lists are kept up to date by adding the names of recent graduates, by the aid of our prescription files, and by comparison with each new edition of the telephone directory. A list of hospitals, dispensaries, dentists and veterinarians is also kept.

We have a fairly comprehensive list of nearly 15,000 names of residents of our own section of the city (East Washington) within a radius of about a mile. These names are taken from the city directory by our cashiers during leisure moments, and are supplemented by names obtained from the post-office (of which we have a sub-station), from the poison register, from friends, patrons and others.

We keep our mailing lists revised by consulting each new edition of the city and telephone directories, and by keeping a record of the returned undelivered mail matter.

We use the list of "preferred" physicians about once a month, for the purpose of calling their attention to several features in our store, modern facilities and equipment in the prescription department or laboratory, to some new remedy, the receipt of a fresh supply of oxygen gas, vaccine and other biological products, etc., etc. The doctors are invited to inspect our establishment, to see our mixing machine, tablet machine, our vaults and storerooms, our method of keeping biological products, or we offer them the use of our equipment for making urinary analyses or microscopical examinations. At another time we mail a description of our "Ideal Maternity Packet," giving the contents and price, or we advertise some other specialty which we prepare or are agents for.

Price lists of clinical thermometers, surgical dressings, ligatures, needles, hypodermic syringes, microscopical supplies, test-solutions and stains, clinical wire, and many other items not generally carried in the average drug-store, are good subjects for advertisements to physicians.

All our letters are typewritten *personal* ones, and all mail matter, whether letter folders or cards, when sent to physicians, is sealed and sent as first-class matter, for the reason that busy doctors, like most business men, frequently consign ordinary second-class matter to the waste basket. Not so with the average layman. He opens and more or less carefully peruses all his mail. Therefore, when we wish to reach the householder, we use cards or, preferably, good, substantial, neatly-printed folders enclosed in unsealed envelopes and mailed as second-class matter.

On the last page of such folders we print something to induce the receiver to preserve our advertisement, such as a calendar, baseball schedule, general household receipts, or other matter of lasting interest. On the front page we sometimes use a cut—some interior view of the store or laboratory, or a picture of the building.

I enclose a folder, nearly 15,000 of which we sent out a short time ago. These produced very satisfactory results, and I believe this kind of advertising is by far the best for retail druggists who are located in residential sections, but, like every other branch of the business, it requires considerable time and work even after the mailing lists are compiled.

We have occasionally distributed circulars from house to house, but have long since discontinued this method.

H. F. Ruhl, Manheim, Pa.: I get names for our mailing list from the following sources:

1. The poison register and the telephone book.
2. The publisher of the local paper.
3. When goods are ordered by mail.
4. By personal inquiries. Under this head I may say that after a given lot of advertising matter is mailed, a certain proportion is reserved and customers are asked if they have received a copy. If the question is answered in the negative, the customer's name is entered and an explanation is made. Customers generally appreciate this courtesy.

The mailing list is then kept revised:

1. By noting the changes of people's addresses as published in the local paper—particularly with reference to people moving in or out of town.
2. By personal inquiries as stated under paragraph 4 above.
3. By sending addressed and stamped envelopes to the postmaster and R. F. D. carriers, requesting their return if undeliverable.
4. By comparing the list with the subscription list of the local newspaper

My mailing list is kept by the card system, and names may consequently be added or dropped with very little trouble.

The list is used for advertising matter sent out at stated intervals and on special occasions. Matter furnished by manufacturers is included, that on proprietaries excepted.

Early in the spring I mail an eight-page price list of garden seeds, together with some other seasonable matter. During the spring I also mail a circular or large post-card devoted to house-cleaning goods, stock remedies, and seasonable preparations of my own. In August I use a circular devoted to my annual stationery sale. In November I mail a circular on pepper, butchering supplies and seasonable preparations of my own manufacture. In December I make a Christmas announcement.

I usually employ one-cent postage, for I find that rural patrons are not so discriminating as the people in larger cities, and do not have so much mail matter to read.

Let me conclude by saying that large mailing cards, needing only to be addressed and stamped, save much labor involved in the folding of circulars and enclosing them in envelopes. I find they give excellent returns.

Franklin M. Apple, Philadelphia, Pa.: My mailing lists are compiled from two sources, viz., the city business directory and the assessor's lists. Copies of the latter can be had from a political worker if arrangemets are made for them in ample time. A separate list is compiled from the business directory of medical practitioners with whom I care to keep in touch from time to time. This list requires considerable labor to prepare, but the time and effort spent upon it will bear abundant harvest if properly used later.

The revision of the mailing lists consists in replacing the last list of voters by the latest one to be procured from the proper individual and noting thereon any corrections that may come to our notice from day to day. The physicians' list requires far less revising, as doctors are not such great migrators as the general public.

The chief use to which our list of the general public is put is to serve as an encyclopedia for the public when inquiry is made as to the address of a resident of our immediate section, but we find it of use occasionally to send out notices or special advertising matter to our patrons or desired patrons.

We have no regular stated times at which we send out advertising matter, the occasion for its use being determined by circumstances that arise from time to time.

We generally use printed matter, the proof for which is prepared personally, and send it out as first-class mail matter, as all first-class work should be sent. Assuredly the subject matter intended for the medical profession is of a different character than that prepared for the laity. We rarely make use of any of the "stock" advertising matter prepared by the large manufacturing pharmaceutical houses for various reasons.

Lastly, but certainly not of least importance, I wish to call attention to the fact that we *do not* prepare lists of our customers for the use of patent-medicine manufacturers, thereby swelling their "sucker lists," for I consider it a violation of trust to place lists of one's patrons in the hands of the class of men who usually constitute the patent-medicine manufacturers.

W. M. Federmann, Kansas City, Mo.: Names for our mailing list are taken from our charge customers, the telephone directory and what is called the "Blue Book" (giving the names of the society people in Kansas City).

We go over our list about once a year and in addition to this we make whatever changes we note from time to time.

The list is used for mailing samples of perfumes, for exploiting special events such as souvenir and anniversary days, and occasionally for advertising special lines we desire to push.

The list comes in use about five or six times a year. Most of our mail is in letter form carrying two-cent postage. We do not believe in postal cards or one-cent postage. Results from such advertising have not been successful with us.

Louis Schulze, Baltimore, Md.: The names for our mailing list were obtained by making a memorandum of addresses to which medicines were sent; by taking names from the wagons of farmers passing the door of the store, or inducing boys by a small reward to do it for us, or by copying names from the newspaper reports of the meetings of Grangers' societies. The list is corrected by comparison with each new city directory and by inquiry from farmers. We use the list for calling attention to seasonable

goods, specialties and our prescription work. For a time we sent out mail matter monthly, alternately using cards, booklets, circulars, fans and personal letters, using a one- or two-cent stamp according to the matter sent.

Jacob Diner, New York City: In elevator apartments I get the names from the hall boy; in ordinary flats from the letter boxes in the vestibules. The apartment names are kept corrected by getting new lists once every six months, since tenants in these houses are under lease; in flats by checking off every two months. I use the list for mailing advertising matter of my own. Advertisement matter is sent about twice a month, using printed circulars, mimeographed invitations, personal letters, leaflets, etc., as occasion requires. I always mail such matter under two-cent postage.

Cornelius Osseward, Seattle, Washington: The only list we have is a physicians' list. We endeavor to have on it the name of every new physician who locates in our city. We usually find them when making our monthly calls to the different office-buildings.

We compare our list with those carried by the different detail men who visit our city and find that some have very accurate lists which are usually up to date.

We use the list to inform our physicians of anything new which may be of interest to them.

We send out mail matter very frequently but not regularly. Whenever we have anything useful, a postal, circular, booklet or card is mailed; it all depends on which subject we wish to speak about. We never use one-cent stamps for such matter, as it is most likely to go to the waste basket without being opened.

The Chair invited discussion on the paper just read, and called attention to this paragraph in Mr. Flemer's contribution to the subject:

"On the last page of such folders we print something to induce the receiver to preserve our advertisement, such as a calendar, baseball schedule, general household receipts, or other matter of lasting interest. On the front page we sometimes use a cut—some interior view of the store or laboratory, or a picture of the building. I enclose a folder, nearly 15,000 of which we sent out a short time ago. These produced very satisfactory results, and I believe this kind of advertising is by far the best for retail druggists who are located in residential sections," etc.

Mr. Mason said the unique feature of this advertising was, that he puts on the advertising folder some information of interest which will cause the folder to be retained instead of being destroyed. He called attention to the copy of the folder sent by the author, and to the fact that on the last page it contained information how to remove grease-spots. There were a great many interesting points worked up in this symposium. For instance, there was a difference of opinion as to whether one or two-cent postage is the better, some of the contributors holding that one-cent postage gives

the best results in advertising, especially in the rural districts, while the rest say that unless a two-cent stamp is used the matter will not be read at all. There were other points of a similar character that the Chair invited discussion upon.

Mr. A. I. Cohn had found that so far as the use of a one-cent stamp was concerned, the sending-out of return postal cards had brought him in perhaps sixty per cent. more replies than when he sent out posters with a two-cent stamp on them.

Mr. Carl F. J. Dyna thought it was better to use a two-cent stamp, especially in the larger communities.

Mr. W. B. Philip had found the sending of advertising matter through the mails to yield better results than anything he had ever tried, and with the physicians he used only a two-cent stamp. The minute the recipients find there is something of value inside they will open the package. This plan had given him easily fifty per cent. better results than anything else he had ever tried.

In response to an inquiry by the Chair as to what methods he pursued to get the necessary lists, besides those mentioned in the paper read here, Mr. Philip said that he got them from blotters, delivery calls, telephone books and from personal inquiry.

Mr. E. G. Eberle said he had used the county assessor's books to good purpose in getting up such lists, but that the poll-tax lists were especially valuable, because they not only gave the names of the parties but also their occupation. The fact that a man is paying taxes indicates that he would make a better customer than the man who is not.

Mr. Leet thought the birth list was one of the best that could be used, and strange to say he had had good returns from the dog-license holders. They had fleas in California, but they were not always combined with dogs, he said. Another class he gave attention to was the automobile owners, and druggists who were commercial enough to carry a line of traveling-bags and such articles as they were accustomed to use would get good results.

Mr. Valentine Schmidt said that for many years he had employed a method of advertising that had been very successful. He would go to the Japanese stores, for instance, and procure some unique article that would hold perfume or sachet-powder, say, and send these out to his trade. He had distributed hundreds of sachet-bags. Sometimes he would use a rolled shape, like a tomato, filled with fine sachet-powder and having a colored ribbon attached bearing his name. The ladies would keep a thing like that, and whenever they saw it it would be a reminder of the sender. At other times he had sent out handkerchief-holders, perfumed with a little sachet-powder, and with a bit of blue ribbon carrying his name; these cost some fourteen cents each. Still another scheme was to mail from time to time a neatly printed slip or card, lauding some par-

ticular preparation that he might make—his cold-cream, or a tooth-powder; something like that. He also enclosed these with his bills sent to customers. He had found these very effective, and it helps to keep before the customer the things the druggist makes the most money out of. "Push your own preparations," said Mr, Schmidt. "We are too prone to push somebody else's article, where we make ten or fifteen per cent., and sometimes less. We go so far, even, as to lend these people our building, on which we pay rent." He said he was sorry to see a great many windows in Los Angeles disfigured by all sorts of things—dog-biscuits, and the like—that did not belong to the drug business.

Mr. Osseward asked Mr. Schmidt about the cost of his advertising. He said it struck him that it must be quite costly, as he understood him to say that he gave fourteen cents each for his handkerchief cases, and everybody knew that good sachet-powder was expensive. Mr. Schmidt explained that he did not send these out to Tom, Dick and Harry, but went to the telephone directory, or other sources of information, and picked out the names that he thought it would pay to send to, and in that way he had reduced the number of such articles sent out to some four or five hundred. The amount expended was comparatively small, while the returns were large. Of course it cost money, but where the pharmacist made his own sachet-powder it would reduce that cost.

Mr. J. M. A. Laue, said he had good results from sending out return post-cards to the ladies, asking for names and addresses, for which they would receive a jar of "Laue's Celebrated Cold Cream." The ladies were a little susceptible to this preparation, and always appreciated a good article. He had a large mailing-list, and had made many customers in this way. Another scheme he had worked successfully was, when any actress of note came through his city he would present her with a sample of this cold-cream, and in nearly every instance she would acknowledge it with a beautiful autograph letter, and frequently with her photograph, and he would use these as a window-display.

Mr. G. H. P. Lichthardt had found the best and quickest results from the "great register"—the poll-tax list. "I am not a pharmacist," he said; "I am one of these scientific guys, and I advertise my prescription business in that way." The sending-out of calendars he had found to be a good method of advertising. In making up his mailing-lists he bore in mind that in one section of the town one thing would sell and in another something else.

Mr. J. A. Sanford thought that the value of a mailing-list depended altogether on the proper preparation of the advertising matter used. If it is improperly or carelessly prepared it will fall flat. The make-up of a mailing-list should be governed by the character and nature of the business advertised. Many things that would be suited to a dog-list, for example, would be altogether useless when it comes to a birth-list. After

considerable experience in the use of mailing-lists, he had found that there was only one list where the druggist could go "right straight down the line," and that was the assessor's list. This was more difficult and expensive to procure than almost any other list, to get a good one, but it was worth having. One form of advertising that he had found especially valuable was a city map, on the margin of which could be printed certain valuable information and advertising matter. The people will keep this, and it will make many new customers for the pharmacist. These maps should be revised from time to time and kept up to date. He considered this as not the cheapest, but one of the best forms of advertising, and he advised it for cities of moderate size as well as for the larger centers. Nothing of this sort will give good results, however, unless thought is bestowed on the advertising matter sent out.

Mr. E. L. Baldwin thought the way to build up a mail-order business was by the use of a follow-up system. The experience of every mail-order house shows that the only way to get good returns is by persistency. "You must stay with it twelve months in the year," he said, "and keep corresponding with the same people."

Mr. James G. Steele, an old and honored member of the Association, told of the druggist's experience in the long ago. He went away back to 1858, at the beginning of his career, when telephones were unknown and voting-lists and assessors'-lists were not thought of. He recalled an attempt of his preceptor at that time to get at the country business, and told of how he had sent out blanks to the 1500 postmasters in California at that time, asking them to fill in with the names of some ten or fifteen parties of the class desired to be reached. Out of that list he had gotten some 1200 replies, averaging ten names to the list, which he thought was a very good result for the expenditure of time and money involved.

The Chair stated that the discussion had been very interesting on this paper, but inasmuch as the Section had a number of other papers for consideration he thought it would be well to proceed now.

The next paper on the program was a symposium upon the subject, "My Best Selling Soda Syrup"—a practical question. The Chair thought as none of the authors were in the room this might be omitted. The text of the paper here follows:

MY BEST-SELLING SODA SYRUP: A SYMPOSIUM.

F. W. R. Perry, Detroit, Mich.: Our best-selling soda drink is chocolate. It is made by the following process: Add 6 ounces of chocolate to 1 gallon of syrup; mix well; bring to a boil, *and boil well.* We serve this chocolate with 2 ounces of ice cream, and it costs from 2.8 to 3 cents a glass. When we dispense it as a sundae, we use 4 ounces of ice cream, and the cost is 5 cents. We get 5 cents for the ice-cream soda and 10 cents for the sundae. Our chocolate is advertised chiefly by means of

strips in the window and on the mirror back of the fountain. It is featured in this way all the time.

Katz and Besthoff, Ltd., New Orleans, La.: We sell more orange syrup than anything else, and it is made from the pure orange juice and granulated sugar. Here is the formula :

To every gallon of freshly expressed orange juice, add 12 pounds of granulated sugar, which has been previously rubbed up with the grated rind of the oranges from which the orange juice has been expressed. Then agitate the sugar and the juice, and prepare the finished syrup by the cold process.

We do not advertise this drink, and it has made its way wholly by the sheer force of quality. We figure that it costs about two cents a glass to serve.

Arthur L. Cheney, Morrisville, Vt.: Chocolate is by far the best seller at our counter. We make it after the following formula :

Dissolve ½ pound of Grootes cocoa in 12 ounces of hot water; bring to a boil over a slow fire; to this add hot syrup prepared by dissolving 6 pounds of sugar in 3 pints of water; after both solutions are well mixed together, boil over a slow fire for ten or fifteen minutes and then strain. After the syrup is cold add 1 ounce of vanilla extract and a little soda foam.

The syrup is then ready to serve, employing the usual amount to each glass. We use about 2 ounces for ordinary soda and 1 ounce for a sundae or " college ice." We have not found it necessary to advertise this drink except to have a card on the fountain reading " Our Chocolate is Right !"

We estimate that this drink costs us about 3 cents a glass to serve as an ice-cream soda. This cost involves all the expenses attached to the service, and leaves us a net profit of only 2 cents, since we get but 5 cents for our soda.

George A. Gorgas, Harrisburg, Pa.: I have not made an exceptional run on any particular drink, having featured a number continuously. Probably the one having the longest continuous run is " Eureka Coffee." From it has developed a number of similar drinks, but the original to this day maintains its supremacy. We make it as follows :

Coffee syrup	1½ ounces.
Vanilla syrup	½ ounce.
Ice cream	1 teaspoonful.
Cream	½ ounce.
Egg	1.

All is shaken with ice, strained in a 12-ounce glass and the latter filled with carbonated water. We make the coffee syrup from equal parts of Java and Mocha by percolation, the percolate dripping on the sugar, and as soon as the sugar is dissolved, we strain the syrup.

The cost of this drink, of course, depends on the price of eggs, varying

from two and a half to four cents a glass. We sell it at ten cents, and make a handsome profit. The principal way in which we have featured it has been by signs at the fountain and by word of mouth, recommending it to our customers and they to their friends.

E. E. Calkins, Ann Arbor, Mich.: I have found the following soda drink to be the most popular with me this season:

Fluidextract of celery seed	2 drachms.
Terpeneless limes	1 drachm.
Fruit acid (50 per cent. citric acid)	1 ounce.
Lemon yellow coloring	q. s.
Syrup, enough to make	1 gallon.

Draw 1 ounce of this syrup in an 8-ounce phosphate glass and fill with carbonated water.

Lime juice might be substituted for the "terpeneless limes" and "fruit acid," but at greater expense. The cost of the drink is about 1 cent a glass. It has been advertised chiefly by giving away tickets like the following:

GOOD FOR ONE GLASS OF

CELERY-TONE

FOR BRAIN WORKERS

FREE

E. E. CALKINS, 324 State Street

I have found, however, that it does not pay to mail out these tickets to housekeepers, because instead of using them they give them to children.

William G. Greenawalt, Philadelphia, Pa.: It is rather difficult to say that any one drink is *the best seller*. We find all the fruit flavors popular, each in its season. As usual, the Americans do not stick to any one thing, but want a constant change. Those who drink strawberry early in the season are just as fond of raspberry later on, and still later on ask for peach, as though it was the only thing they had ever liked. Yesterday's flavor is *passé*, and today's is the fruit which is in season. The crushed fruits all sell very well, but if there are any drinks that can be called best sellers and regular ones, they are the egg drinks, which have the call now.

People who never before patronized the soda fountain, now appear daily for an egg drink—egg phosphates, egg and milk, egg chocolate, and a number of other mixtures and concoctions which are readily invented by an energetic dispenser. Eggs, with a combination of milk and syrup, have come to be a very fashionable drink, because of the idea of nourishment and the benefits to health. There is no particular formula—it all

depends on the man behind the counter who mixes the drinks. Each soda dispenser has *his way*, and each considers his the best. The sundaes and ices are also extremely popular, and the dainty elegance of a sundae or "college ice" will attract patrons for blocks.

After all, the way these drinks are gotten up and served has everything to do with the volume of business that is done in them. About the only way we feature or advertise our soda is by an occasional window display during the season.

We make a pretty show by filling soda glasses with colored water, and by the use of slabs of glass mounted upon each other in pyramidal style. To show sundaes we fill sundae cups or glasses with absorbent cotton, which *looks like ice cream*, and upon the crest of these sundaes we place real Maraschino cherries. A spoon upon the saucer makes the effect complete, and it all really looks quite appetizing. What is apparently a glass of root beer is really only a glass of caramel-colored water, with a fluffy, foamy top, comprising a layer of cotton so placed that it does not sink and absorb the liquid.

Indeed, with a little ingenuity a most attractive window can be arranged, and of course all the soda supplies and fruits can be utilized. Such a window invariably brings in the customers, especially if there is evidence inside of neatness and cleanliness throughout all the soda arrangements.

James L. Avis, Harrisonburg, Va.: Our best-selling drink at the fountain is chocolate ice-cream soda. We use any brand of good chocolate in making the syrup, and follow the formula printed on the container. The drink is advertised in the daily papers and by circulars. It costs about 3¼ cents to serve, and while the profit isn't very large, we find that the product is an excellent advertisement for the soda fountain business generally.

The Chair said the next paper was one on "The Preparation and Use of Show Cards"—a paper and an exhibition. The author was a young man of Watertown, Wis., Mr. A. R. Eberle, who had made quite a success of the writing and use of show-cards. He said the paper would be presented by his distinguished uncle, Vice-President E. G. Eberle. Mr. Eberle thereupon read the paper, and exhibited the show-cards sent by the author as illustrative of his paper.

THE PREPARATION AND USE OF SHOW CARDS.

BY A. R. EBERLE, WATERTOWN, WIS.

Every druggist, be he in a town or small city, must realize the necessity of show cards to assist in selling the goods he may display in his show window. They state the selling price and explain the use of the articles shown. The druggist located in a large city who can afford the services of an expert show-card writer is not confronted with the same obstacle that the dealer in smaller places has to contend with. The latter probably

cannot afford an especially trained man for the work, or a man of this kind is not available. The making of such cards, therefore, devolves upon the proprietor or one of his clerks, and the question then arises as to the best means of making the neatest-appearing cards.

A great many druggists use the free-hand or written card, but while this sort of a card possesses an individuality which the printed card lacks, nevertheless the latter is to be preferred on account of its neatness, more finished appearance, and the fact that it is more easily read.

The writer uses a so-called "Easy Sign Marker" for the printing of these cards. Such printing outfits can be had under various names for from $1.60 to $2.50, depending on the size of the face of the type. An even better sign-maker than the above is one in which the letters are outlined, giving an opportunity of making certain words prominent by filling in the letters with another colored ink than that used on the rest of the card. Such an outfit is, of course, more desirable, and the cost is from $12.00 to $16.00.

With a little judgment and practice in laying off the space, any one can in a short time become quite proficient in the manufacture of his own show cards. Black ink on white, ten-ply cardboard is the best to use. This cardboard comes in sheets 22 x 28 inches, and two 14 x 22 signs can be made at a cost not to exceed two cents each, not considering the time employed.

The first cards made for our store were simply descriptive of the goods for sale or of the store service. Later the cards were rendered more attractive by surrounding the wording with a heavy red line, an ordinary ruling-pen being used for the purpose. Still later the cards were further improved by pasting an appropriate picture on the card, these being obtained from discarded periodicals, calendars, and so forth.

These pictures add life to the cards and catch the eye, where a plain-printed card would pass unnoticed. By way of example there are herewith given the wording of two cards with well-suited cut-outs. A picture of a gentleman smoking in a large easy-chair would be very apt for a card bearing this message: "Enjoy your after dinner smoke. Try one of our 'Ben Ali' cigars. Price, 5c." A card with a picture of "The Father of our Country" was used in this way: "Washington *could* not tell a lie. We *can*, but won't. What *we* tell you about our goods you can depend on."

So far these cards have only been suggested as an aid to window exhibits. In our store, however, we not only use them in this manner, but also have signs so arranged throughout the store (by suspending them from a heavy wire) that no matter which way the customer looks, some statement about the store or its goods will attract and present a selling argument.

Here it might be well to discuss the arrangement of the subject-matter of your cards so as to get your customer to read them. According to good

ad writers, four basic principles should be adhered to in the wording of your signs. They are:

Getting attention,
Creating desires,
Convincing,
Causing sale.

In getting attention there are several things to be considered. Probably the best method of attaining this end is the use of a fitting illustration, for, as any one who reads the newspapers knows, the eye will naturally read those ads first which have illustrations in connection with the reading matter. Another point not to be lost sight of is the typographical appearance of your card. Arrange the reading matter so that there will be about the same margin of clear space on all sides, and still another feature is to underline and enlarge the headline.

Having attracted attention, you should next strive to create a desire for the article advertised. This may be accomplished by so describing the article as to appeal to the reader's vanity, comfort or convenience. If, for example, it is a shoulder-brace, tell how much better the reader will appear with his shoulders straightened and how little discomfort he will find in wearing them.

The desire being created, you should then convince the customer that the article is what it should be by speaking of its quality and durability. A woman might desire a certain water-bottle you are advertising, but unless she is convinced that it has quality and durability she would hardly purchase it. These, therefore, are two points you should bring out.

After having convinced the reader of your card that the article advertised is a desirable one, your next endeavor should be to cause a sale by showing that the price is reasonable, and that to buy the article is therefore a matter of economy.

In treating the subject thus far it has been the endeavor to tell what principles are involved in the making-up of a show card. Now let us consider how the cards should be worded. Do not use either too few or too many words, but rather, as Mr. Gable said in an article read before the A. Ph. A. in 1903, "make the wording of your cards bright, terse, snappy, convincing, suggestive and timely." The author of an article appearing in the August "New Idea" advises that you appeal to your customer's egotism and turn it into dollars. "John Smith is always more interested in himself than in you or any one, or anything else. Then make your appeal to John directly and personally."

Apply this same principle to your cards, and, instead of saying "Our great tooth-brush sale is on," try this: "An opportunity for you to get a tooth-brush at small cost." Also in place of "A great value in tooth-brushes," change it thus: "These tooth-brush prices mean a saving to you."

The author of said article goes on to say that while this direct appeal may seem like an unimportant feature, it is not deemed so by men who are making serious and successful work of their advertising.

Here is the wording of a few cards which will serve to illustrate the various features spoken of in this paper:

"A man with corns on his feet has a right to growl until he has used Oriental Corn Cure. Price, 25c. a bottle."

"Be kind to your skin. Try a box of Elite Face Powder. Price, 35c. a box."

"If you have any objection to growing up through your hair, try a bottle of 'Crown Hair Tonic.' Price, 50c. a bottle."

"If you are satisfied with our goods, prices and service, come again."

"She raves over Orange Blend, our new drink. 5c."

"We have the kind of infant foods that will keep your baby healthy and happy."

"Have you examined our new Cameras?"

"Question your doctor as to the prescription service we give."

"Be fair to your physician—Let us fill his prescriptions."

"We fit trusses—and guarantee the fit. Our prices are as right as the trusses."

"Glad you stopped—Walk in."

In conclusion it may be said that the free use of show cards, not only in the window, but more especially inside to advertise the store, your goods and service, will be found (by any one not already using this kind of advertising) to be a paying investment. The expense, as already explained, is almost nominal.

The Chair invited discussion, and Mr. Philip commended the show-card idea in advertising, if the cards were made tastefully and well. This would involve thought, especially as to the proper way in which to make the letters of the words used.

Mr. Lichthardt said that for many years he had made signs by a mixture of plaster of paris, water and a little glue—and sometimes molasses, when he did not have the glue. He simply made a free-hand letter by taking this mixture made in small quantities so it would flow, and using a dropper and sometimes what is called an "air-pencil." These signs could be made very cheaply, and at the same time very effective.

Mr. Ladish advocated using white lettering on a black field, instead of black on white, as the author of the paper had done. Such cards would not soil so easily, would last for months, and they were really more attractive.

The Chair called for the reading of a paper by Autumn V. Pease, of Nebraska, on the subject of how to win the farmer's trade, and Mr. Pease presented his paper as follows:

WINNING THE FARMER'S TRADE.

BY A. V. PEASE, FAIRBURY, NEB.

When I look over the faces of my hearers, most of you from the larger cities, I doubt your deep interest in ways of winning the farmer's business. But fortunately this great organization has, through its reporter to the public press, facilities for distributing information to every pharmacist in the land, and our drug journals are always looking for useful material.

The farmer's trade is a portion of my business that I value highly. It is steady and certain. It has to do with a class of goods that do not change in style and that yield a good margin of profit. Then, too, farmers as a class are good pay, for they are usually real-estate owners. They appreciate the good service they get from their dealers, and they do a great deal of word-of-mouth advertising for their good friends among the merchants.

It pays to have a personal acquaintance with the farmer—to know his family, to know what neighborhood he lives in, what kind of a farm he has, its soil peculiarities, his specialties in production, hobbies in chickens, hogs or cattle, and his politics. It does not pay a merchant to stick so close to his business that he cannot learn some of these things. An occasional visit in the country will yield immediate pleasure and future profit.

I believe in newspaper advertising among the farmers. The greater portion of them are readers of the local papers. If you try to put yourself in touch with their needs by really knowing them, you will understand what to advertise. I make the advertising timely and quote prices. Here are suitable subjects: Stock dips, poultry powders, lice exterminators, disinfectants, vermin destroyers, remedies for potato scab and blight, treatments for seed grain, household paints and varnishes, blackleg remedies, sprays for fruit trees, insecticides.

In my newspaper advertisements I frequently publish a formula and general directions for its use. Then I have the printer lift it out of the general page form and print me several hundred extra copies of it. When I have a call for the remedy I hand out one of these slips with the package. It is good advertising, and the customer is pleased to have explicit directions.

One very good way I have of getting an increase of business is to make up Christmas packages for all of my customers, but the farmers care most for them. During the month of December I wrap up hundreds of packages of advertising matter to be handed out. These contain a good assortment of almanacs, a weather chart calendar, booklets on olive oil, stock dips, disinfectants and poultry remedies, samples of my cold cure, headache powders, cough syrup, etc.

Sometimes I have as many as twenty-five different kinds of advertising matter in one package. I do these up in my trade-mark wrapping paper, and neatly tie the package with advertising tape. It makes a bulky, valu-

able-looking package. The English packages are wrapped in one way and the German in another. My farmer friend takes the package carefully home with him. After supper, when the chores are done and he sits down to read and smoke, the package is opened and every piece of advertising in it is carefully examined. It is the best way I know of to get good advertising matter right into the home.

Farmers are frequently in want of advice on various topics that affect their crops or animals. I find it quite profitable to be able to give them this information. It is not at all difficult to prepare yourself to do this. The Department of Agriculture in Washington is a most prolific source of information on every conceivable subject that affects the farmer's interest. Much of this information is distributed free, and such as is charged for is sold at a nominal price.

There is issued from this Department what is called a Monthly Bulletin of Publications. A written request to the Secretary of Agriculture will secure the placing of your name on the mailing list, and you will receive the Bulletin each month free. In it are mentioned pamphlets on subjects that are of interest to farmers, fruit-growers, gardeners, stock raisers, poultrymen, truckmen, nurserymen, dairymen, timbermen and dealers in all natural products. By sending for these pamphlets, many of which are free and others of which usually cost only a few cents, you can get most valuable information.

For many years I have received "The Monthly Bulletin of Publications" and have been asking for the publications themselves. As a result I have accumulated quite a large library of valuable agricultural information. A short list of the topics treated in these pamphlets will open up a field of business for the druggist that looks enticing: Diseases of plants and animals, quality of seeds and treating for rust and smut, preservation of fruits, caring for meat, butter and the nostrums for increasing its yield, sprays for fruits, remedies for potato blight, poisoning vermin, kinds of insecticides, prevention of the spread of various diseases, etc.

The information along these lines which I have educated farmers to seek from me quite frequently leads to the sale of some remedy, the cementing of friendship and an increase of business.

The farmers are frequently imposed upon by some unscrupulous person trying to sell them something to increase the yield of butter fraudulently, or increase the output of eggs, or some way to preserve without sugar or heat. Learning of this through our wideawake pharmaceutical press or the Department of Agriculture, I write a news letter to our local papers exposing the fraud. They willingly publish such letters.

I have both of the local telephones in my store, and in that way can reach nearly every farmer in the county. It is no uncommon thing for me to receive a telephone order at my residence early in the morning for some article to go out on the rural mail routes. I want to digress here to

boast just a little. In proportion to its population my town is the best telephoned community in the world. It is a matter of surprise with us to find a home without a telephone.

I have several copies of a good mailing list and keep it up to date. If some manufacturer offers to use my list in consideration of a purchase of his goods I insist on his using the *whole* list. It is all good, and, if mailing is good advertising, the larger the list, the more profit is there to both dealer and manufacturer.

We have no agricultural fairs in our county, but instead have a lecture course in the winter called the Farmers' Institute. I take quite an interest in this, and occasionally read a paper on some practical subject. I always offer several prizes for farm and home products, none of them very expensive.

I find it a wise plan to be a good-road enthusiast, and to push the movement along. Good roads mean a great deal to me in the regularity of my business and the prosperity of my customers.

All of these methods win the friendship and custom of the man whom I want. It would rob business of half its pleasure to lose this friendship. If both parties to the trade are not benefited the trade had better be left unmade. Playing the game fairly, squarely and successfully is a joy in itself and a large part of life's recreation. And the farmer is a royal good fellow, whom to know is a pleasure and whose friendship is valuable.

The Chair said he considered this a very interesting and valuable paper, and invited discussion on it.

Mr. Philip said that when the farmers' wagons came through his town, he made it a point to have packages of advertising matter ready, containing samples of certain articles, and he would place one or two or more of these packages in the seat of the wagon, and in this way he had managed to reach many farm hands and that class of help that he could not have gotten at otherwise. It had proved a very valuable sort of advertising.

The next paper to which the Chair invited attention was one by J. W. T. Knox, of Detroit, upon the subject, "Building Retail Advertising from a Plan." The author was not present, and the paper was a long one, but it was well worth reading. The Chair considered it one of the most valuable papers on advertising that he had ever read. It was long, but comprehensive, and the author had outlined a systematic campaign of advertising. The full text of the paper is given below:

BUILDING RETAIL ADVERTISING FROM A PLAN.

BY J. W. T. KNOX.

"He never seems to be going anywhere. I like to see a man walk as if he knew where he was going," said the president of a large business corporation in criticism of a new employee.

And that, it seems to me, is what might fairly be said of retail advertising in general, including drug-store advertising.

It never seems to be going anywhere.

It has no particular starting point.

It wanders aimlessly about from one subject to another.

And if it ever gets anywhere it is by accident.

Trace it back to the beginning and you will find, in practically every such case, that the advertiser never knows two weeks ahead what he is going to advertise.

Wednesday comes, the printer's boy arrives under urgent instructions to bring back new copy or instructions to repeat last week's advertisement, and the problem of another advertisement to write stares somebody in the face. Imagine the situation. Customers waiting, telephone ringing, all the other interruptions common to the routine of a store, and then having to concentrate on the difficult and delicate task of persuading people, by means of printed words, to part with their money! No wonder most drug-store advertising is weak, pointless and ineffective! Nor is this condition necessary. It is simply the logical result of lack of preparation, absence of plan; the difference between running a business and being run by it.

Everything worth while is generally done according to a well preconceived and carefully executed plan. To stumble along blindly is to invite disaster.

A man who goes through life without striving to reach any particular goal usually cuts very little figure in the world.

A store that is run aimlessly, without any fixed determination to make it the leading store of its kind in the neighborhood, the town or state, according to the opportunities and ambitions of its proprietor, cuts very little figure in the business world.

Happy-go-lucky methods are unsafe in advertising, as in any other branch of business. Depending on the inspiration of the moment is dangerous, for often when the moment comes the inspiration is lacking. The only safe way, the only way to be certain of having good advertising all the time, fifty-two weeks in the year, is to proceed according to a definite plan, and it affects not only the quality of your advertising copy but its general effectiveness by enabling you to know exactly what you are spending, and to concentrate on the most productive seasons of the year.

To be sure this involves a certain amount of work at the beginning, and at times the task looms up with forbidding magnitude. Any piece of work waiting to be done looks larger than it is, and the longer it waits the larger it grows. But attack it with determination and perseverance and its proportions shrink amazingly.

And these are but a few reasons why advertising should be planned instead of permitted to happen.

A druggist once wrote to me saying he wished to plan his advertising, but didn't know just how to go about it. He was a good, wide-awake

man, too, ambitious and energetic, but he had little or no time to give to the study of advertising. He had never seen a carefully formulated scheme, and possibly was not familiar with the methods of business analysis. There are probably thousands of others similarly situated, and with the hope of giving them some practical assistance I shall try to outline the methods by which an advertising plan is built from the materials in hand, applying principles that hold good in local as well as in national advertising. I shall not, however, enter into a discussion of copy, for that is a separate though closely related question.

THE ELEMENTS OF A CAMPAIGN.

There are five primary factors to be decided: the people, the goods, the mediums, the time and the cost. Or, to express it a trifle more clearly, there are five questions to be answered:

To whom shall I advertise?
What shall I advertise?
How shall I advertise it?
When shall I advertise it?
How much shall I invest?

None of these questions can be easily answered off-hand, simple as any of them may appear, and failure to arrive at the correct decision in any instance may and probably will result in loss instead of profit.

TO WHOM.

We take first the people because they are the one fixed and unvarying factor in the situation. You can adapt the goods, the mediums, the time and the cost of advertising to your requirements, but the people cannot be adapted to anything else. So we must study them, individually and in the mass. I believe failure to understand the people at whom the advertising is aimed is responsible for more advertising failures than any other single cause.

One should know as many of his customers and prospective customers as possible. He should also know their approximate incomes, resources, manner of life—in fact everything about them that will enable him to adapt his advertising to their needs and desires. From this knowledge of individuals he will be able to classify or group them and find that certain kinds of goods will be salable to one group and unsalable to another. He will find that certain kinds of advertising appeal strongly to one group and bring no result from another.

This natural cleavage, according to intelligence, environment, culture, means, occupation, is found almost everywhere. If you could mass all the readers of the Hearst papers, for instance, in one locality, and in an adjoining one place all the readers of the New York *Evening Post*, there would be as much difference in the appearance of the two crowds as in

their size. It is the question of knowing the people that most perplexes the man who advertises on a national scale. Consequently the fact that the retailer can have an intimate and accurate knowledge of his trade gives him an immense advantage over any outside advertiser, if he will only avail himself of it.

Now what happens when one comes to this part of the problem? One man finds that his trade consists chiefly of town people, and the country trade goes to his competitor, for no apparent reason. This man then must formulate a plan for diverting the current of farmer trade—practically always a desirable class. If he takes his knowledge of farmers from the farmers themselves he will soon know how to approach them in the right way; but if his conception of the agricultural class is taken from the supposedly humorous columns of city papers, he still has much to learn and unlearn.

Another finds that while he gets a good trade from factory employees, the folks who live in good houses on the hill have an exasperating way of going elsewhere, though the other man's stock is no better and his location no more convenient. There is no trouble in finding the target for his advertising, and he must study those people's preferences, get acquainted with as many of them as he can, learn their favorite kinds of goods, and prove to them that he is their sort of druggist.

Nor is the style of residence necessarily an indication of the money spent. I once knew a druggist to say that he greatly preferred to do business with people who live in flats, as they were "better spenders" than those who owned their homes; curiously enough this was confirmed by the comment of a laundryman a few days later who referred contemptuously to the residents of a certain handsome city street in this way: "Huh, those people are no good for my business. They are all paying for their homes, and the men wear soft shirts to save laundry bills. They send three or four collars a week to the laundry, but have their shirts put in the family wash." Remarks of this sort based on some man's experience make real information for the man who is closely studying his surroundings from the standpoint of trade possibilities.

Pages might easily be written on this, but after all it is something that each must work out for himself. As an aid, however, towards our analysis we may classify people as follows:

Prosperous or Poor.
Liberal or Economical.
Country or Town People.
Cash or Credit Buyers.
Householders or Tenants.

In determining the area from which trade is to be sought aggressively follow the advice inscribed on the gates of Busyrane, "Be bold. Be bold, be bold, and evermore be bold. Be not too bold," and make the area

large enough, surely large enough, but not too large. The reason is plain. Most druggists operate on a very limited advertising expenditure through force of necessity, and it must not be spread out too thin. It is better to reach three men four times with a good piece of advertising than twelve men one time. Yet I find that many are not sanguine enough on this point. They acquiesce too readily in a competitor's apparent control of a desirable class of trade, and make no effort to secure it for themselves, when very often the only reason he holds that trade is because no one has tried to get it away from him, while a few just as foolishly try to accomplish impossible things.

Beyond all question, the people, while a fairly constant and practically unchangeable factor in the situation, are also the most complex, and too much study cannot be given to them in formulating your advertising plans.

WHAT TO ADVERTISE.

With a stock of several thousand different articles in the average drug store, the druggist is often at a loss to know what he should advertise. I am perfectly convinced of the correctness of this statement after looking over hundreds of drug-store advertisements and finding articles advertised that are neither profitable nor in demand, nor yet likely to serve in any but the remotest way as trade builders.

The trouble here is, as I have already said, that many stores have no fixed policy; no definite end in view. They drift along selling what is called for, taking what trade happens to come their way, advertising what they happen to think of fifteen minutes before the printer wants copy, and let it go at that. The fact that some of them prosper under such a lack of policy means nothing except that they would prosper much more if they knew just what they wanted to do, and then strained every nerve and muscle to reach that goal.

In deciding what to advertise, therefore, one must answer some such questions as these, and the answer must be right in view of existing conditions:

Shall I advertise quality or prices?

Shall it be something profitable in itself, or a short-profit leader merely to attract custom?

Shall it be an exclusive line that I control or a line open to general competition in which I can offer as good or better values than my competitor?

Shall I try to build up my whole trade or concentrate my efforts towards the development of a certain line or department?

Is my location such that I can call attention to its convenience, or am I at such disadvantage in this respect that I must offer other inducements to overcome it?

Is my store service at such a high point of excellence that I can invite comparison with other stores, or must I improve it greatly before this can be done?

Now the answers to some of these questions will depend largely upon the class of people to whom you must make your appeal, and I can lay down no general rules covering the matter that are not well known to the average man of business.

For the most part I think definite results are likely to be gained by building up a reputation for quality, rather than cheapness; and by advertising profitable goods rather than "leaders," since the latter develops a class of bargain-hunters and tends to estrange the better class of trade.

There is also a strong tendency towards "exclusive agency" propositions and my own feelings, if I were a retailer, would be in favor of developing the best of these, and to a considerable extent escaping from ordinary competition; though there are conditions under which such a course would not be advisable. In developing an exclusive agency line one usually has the benefit of help from the manufacturer that counts for a great deal.

Again, I would probably try to develop certain lines of trade in preference to making a general appeal for all kinds of trade, the point being that in specializing my advertising would be more incisive, more likely to appeal with compelling force; it would give me an opportunity to put selling talk into it, to be definite, to give clear-cut, logical reasons. After one department was built up I would make a specialty of another, and so on until in time my store would be known as headquarters for everything in its line. When I speak of specializing along a certain line, I mean doing it and not just claiming to do it.

THE MEDIUMS.

Having decided what shall be advertised and to whom, the next thing is to determine how the advertising is to be done—what mediums are to be employed. We may roughly divide these into two general classes as follows:

General.	*Direct.*
Newspapers.	Booklets.
Street cars.	Leaflets.
Billboards.	Letters.
Programs.	Mailing Cards.
Signs.	Package Slips.
Windows.	Own Paper.
	Almanacs.
	Calendars.
	Novelties.

The reason for this classification is evident, since the circulation of the one class is not under control while the other is.

No city druggist, doing a neighborhood business, would think of using

the daily papers which circulate all over town, 90 to 98 per cent. of which circulation is wasted as far as he is concerned. Hardly any down-town druggist, who gets his trade from all over the city, would think of doing without daily newspaper advertising.

It is not safe to lay down any hard-and-fast rule, but ordinarily one could not afford to use a newspaper where the waste circulation (among people whose trade is undesirable or cannot be expected) amounts to as much as fifty per cent.

Programs are doubtful mediums at best; an exceptional location convenient to theatre crowds however, may make them very valuable to the druggist so situated.

The windows are among the best and hardest-working of salesmen; and like all good salesmen, they need good treatment to make them produce their full capacity.

Street-car and billboard advertising are too expensive in the larger towns for any but the very largest stores. In smaller towns the patronage of the cars is too limited to make them worth while, as a rule; but bill-posting is not expensive in smaller places, except for the cost of the paper which is practically prohibitive unless one is willing to use small space and the very plainest and most commonplace designs.

Under general advertising, therefore, we are limited in most cases to newspapers and the window display, and even the former may not be advisable. But the windows should be worked to the limit.

AIM STRAIGHT AT THE CUSTOMER.

Direct advertising is the kind for most drug stores.

You can send it where you like.

You can tell your story in convincing detail.

You can adapt it to any desired classification of your mailing list.

You monopolize your reader's attention, instead of sharing it with other advertisers.

You have more latitude for the play of originality.

I shall not discuss the different mediums of direct advertising separately. This is something that like most everything else in advertising, calls for some of that expensive instruction given by the oldest of teachers—experience.

I do believe, however, that personal letters are too much neglected. There is a directness and strength of appeal in a well-written letter that is not quite equaled by any printed form of advertising; provided it is kept down to reasonable brevity. I never, under any circumstances, allow an advertising letter to run over one page.

WHEN TO ADVERTISE.

Many articles sold in drug stores are salable only at certain seasons.

Any druggist knows what they are and when they sell. To be sure the drug-store advertisement of holiday goods that is allowed to run until July, only to be succeeded by a summer advertisement that stands unchanged until the middle of December, is by no means uncommon, but this is not advertising—it is simply burning money in one of the least enjoyable ways.

In making up a list of articles to be advertised during the year, one will naturally include several seasonable products or lines. On the written schedule for the year's advertising the time to devote to these articles is first indicated, and the remaining time apportioned among the remaining items which are practically as salable at one time as another.

The ease of determining when to advertise any article should not, however, be allowed to deprive this phase of full consideration. There are other things besides seasons that have an important bearing; among them are market conditions (time to buy at best advantage); effect on other non-advertised departments of the store; conditions of local money supply; local events of importance; possibly a competitor's established policy, and so on.

The advantages of knowing when a certain thing is to be advertised I have already mentioned. But I wish to emphasize again the point that advance knowledge always admits of adequate preparation. If you know in January for instance that you are going to feature your flavoring extract of vanilla strongly during May, you will almost unconsciously be on the alert for all kinds of information about vanilla, and will accumulate a great deal that would otherwise have escaped your notice. You will hear about people who wish they could get better vanilla than their grocer has been supplying; you will learn of chances to sell your product in quantities to some baker or confectioner in the next town, and so on.

While on the other hand, if you have made no preparation in advance you will be wondering what it was you saw in a drug journal the other day about vanilla that would be a help right now; and no one can find that copy of the journal. It is astonishing how little one can write on a subject of this sort without having studied it.

There is nothing like knowing just what you are going to do when the time comes.

THE COST.

This I fancy will often be perplexing. Unless one knows pretty closely how much money he makes out of his store every year, he will not know how much he can afford to invest in advertising. On a $12,000 yearly business, I should think $600 a conservative appropriation. To many it will appear the wildest extravagance. To a few it will look like parsimony. Whichever may be nearer the truth, there is no doubt that $600 spent judiciously in a period of twelve months will buy a great deal of very valuable publicity.

On this question of basing one's advertising appropriation on the amount of yearly sales, there is some difference of opinion among advertising men. Naturally it does not apply to a newly established business, which has no such data for guidance. One very successful automobile advertiser says, "Never base your appropriation on the amount of business you are doing—base it on the amount you can reasonably expect to do." This is a very comfortable theory where capital is not lacking, and where the advertiser has good, strong heart action. It is no doubt the quickest way. But it is hardly practicable for the average retail drug business. A good plan is to lay out a campaign as it should be, regardless of cost; then cut it down to the amount you can afford to invest.

And there is also the element of time to be considered. Advertising that is really good grows in effectiveness. Six hundred dollars spent in a year will accomplish a great deal more towards building up a business than the same amount spent in a week; on the same principle that while twenty-one meals a week are a good thing, it is not advisable to take them all in one day and fast the next six.

It is quite possible to know in advance what your advertising matter is going to cost you, when you know what it is going to be. The rates for newspaper space can be had for the asking, and of course this applies to the other general mediums.

On your direct advertising the best way is to submit dummies to one or more good job-printers with an estimate of the quantities needed, and your costs will soon be definitely known. Keep your quantities very close to the actual amount needed; there is no profit in a stack of dead surplus booklets. Package slips, for example, can be very closely estimated by keeping account of the wrapped packages sent out during an average week's business when your campaign is being outlined.

In the case of booklets, leaflets, mailing cards and letters, this simply depends on your classified mailing list, which is an indispensable part of any retail advertising plan. An extra allowance of the first two named may be necessary for counter distribution.

Your printer will probably be glad to help you about making up dummies for booklets. And if he is a good printer his help will be worth while.

In estimating cost of advertising, do not forget to include all items of expense from the beginning, clear up to the time it reaches the reader. This means cost of drawings and cuts, where necessary, the cost of writing if this has to be paid for, and the cost of distribution where sent out by special messenger or mailed. I insist on this because it is important to know exactly what advertising costs you—you *must* know if you expect to advertise intelligently. And it follows naturally that as a matter of convenience you will not charge your advertising against expense, but will have an advertising account in your ledger.

SPECIMEN "LAYOUT."

Now let us take an imaginary store, owned by an imaginary John Layn, who has studied its conditions and laid out a year's campaign.

"*The People.*—My store is located in a town of 4,000, with a rich farming country on three sides of the town; on the fourth side are small timber lands or cleared farms, less prosperous people than prairie farmers. Location of store is excellent, convenient to more than half the town; better than any except my strongest competitor's. My two weaker competitors do not cut much figure in the drug trade. The other man, however, does about twenty-five per cent. more business than I, and is alert and aggressive. He has the advantage of me in country trade, being longer established and better acquainted; I get fully as much town trade, and can get more. His advertising is weak, and his selling methods not specially good. Carries about the same lines, but his toilet-goods department is poorly stocked.

"Farmers mostly run accounts. They are good, but I must keep my capital active, so I shall not go after this trade much until I get stronger. Town people, except merchants, mostly salaried men's families. Fair proportion of home owners. Large proportion of this business is on thirty days' credit.

"Will make my 1910 campaign for town trade, and the better class of country business, treating both alike. The following year I can give special attention to drawing country trade.

"*The Goods.*—My best opportunity lies in developing toilet-goods trade. Will enlarge my line greatly. This brings women, who are always the best drug-store customers. Can build up a good camera business, which also brings a desirable class of customers. Will put in a good stock, teach developing and printing, and give free use of dark-room. Will advertise soda in season and cigars to some extent. Rubber goods also bring family trade, and I will specialize in that line. Finally holiday-gift trade must be advertised heavily. I am going to make mine the quality store of this town, and every piece of advertising that goes out will carry my slogan, 'Quality First at Layn's.'

"*The Mediums.*—My principal competitor uses the local paper only now and then, and small space at that. Looking over the subscription list of the Bulletin I find that it reaches most of the people I want, and about 75 per cent. of its circulation is in my territory. I will use the Bulletin every week, with new copy each time, for a year, as I can get a rate of 12 cents an inch by taking a thousand inches. Publishers will give me considerable free publicity and 500 proofs of each small advertisement. Also I am to write twelve short, signed articles to be published during the year without charge.

My store signs outside are in good shape; do not need repainting. Inside I shall have about ten neatly framed hand-lettered signs, half devoted to special lines and half to store policy.

Window displays as per schedule.

The rest of my advertising will be direct, consisting of:

12 counter or package slips, 500 each.

38 proofs of small advertisements, 500 each.

2 booklets (one for soda, one for rubber goods), 1500 each.

2 circular letters for booklets, 1250 each.

6 circular letters, multigraphed, with addresses filled in on typewriter to match."

SCHEDULE FOR NEWSPAPER CAMPAIGN.

January 6, *Toilet goods;* 13, manicure goods; 20, toilet creams; 27, face powders, talcum powders, etc.

February 3, *Dental preparations;* 10, tooth-brushes; 17, toothache remedies; 24 tooth pastes and tooth powders.

March 3, *Combs and brushes;* 10, soaps; 17, bath requisites; 24, shaving requisites; 31, Easter perfume.

April 7, *Everything for the baby;* 14, nursing bottles and nipples; 21, baby foods; 28, talcum powders, creams, etc.

May 5, *Soda fountain opening;* 12, soda; 19, ice-cream; 26, soda.

June 2, *Camera department and prize offer for best amateur photo;* 9, developing taught free; 16, use our dark-room free; 23, cameras; 30, films, plates and paper.

July 7. *Amateur photo prize award and display of competing pictures;* 14, soda; 21, soda; 28, summer toilet goods.

August 4, *Soda;* 11, soda; 18, ice-cream; 25, soda.

September 1, *Cigar department;* 8, cigarettes; 15, cigars; 22, pipes, smoking tobacco; 29, cigars.

October 6, *Rubber goods;* 13, water-bottles; 20, syringes; 27, trusses.

November 3, *Water bottle sale;* 10, syringes; 17, toilet goods; 24, holiday perfumes.

December 1, *Holiday goods;* 8, *holiday cigars;* 15, HOLIDAY GOODS; 22, HOLIDAY GOODS; 29, sick-room supplies.

(Unless otherwise indicated, space is five inches, double column; italics indicate 10 inches, four columns wide; and small caps 10 inches, seven columns wide; full position guaranteed.)

The above gives 30 per cent. of the space to toilet goods, 12 per cent. each to camera, cigar, and rubber goods departments, 16 per cent. to soda, and 18 per cent. to holiday goods.

COUNTER OR PACKAGE SLIPS.

One to be used in each package of goods and in each letter sent out. The proofs of small ads. running the last three weeks in each month will answer for those weeks. The first week in each month special slips must be used. Subjects as follows: 1. This is a handy store; 2. "Quality First at Layn's"; 3. Telephone and I'll send it; 4. What we haven't we'll get for you quickly; 5. We have the new things first; 6. This is a clean drug store; 7. What "Money Back" means to you; 8. New customers are coming fast; 9. Bring me your prescriptions; 10. If it's advertised I have it; 11. My customers stick to me; 12. I ought to be your druggist.

WINDOW DISPLAYS.

Subjects indicated by the advertising in newspaper for the same week. (If store has more than one window, it is desirable to lay out a schedule for each window.)

BOOKLETS.

One, April 20, on soda fountain; one, October 20, on rubber goods. Circular letter with each booklet. See record book for specifications and how books are to be used.

LETTERS.

Six of these are to be used during the year on special lists.

January 10, I want your account—reasons why mine is the best store to come to. March 10, My line of perfumes and toilet specialties is unequaled outside of the great metropolitan stores—give names and prices; also call special attention to Layn's Face Cream and offer samples. May 10, (To parents of children under two years.) Everything for baby's health and comfort—offer samples of infants' food, call attention to the many things intended specially for young children. July 10, Luxuries for the dental toilet—how a little attention now and then gives perfect dental health. September 10, Buy your cigars here—how I got my splendid cigar trade and how I keep it. November 10, The best place in town to bring your prescriptions. (Dwell on qualifications, equipment, accuracy, and perfect cleanliness.) "Quality first at Layn's."

COST.

I will invest in advertising in 1910		$600 00
1000 inches space in Bulletin @ 12 cents	$120 00	
38 package slips, 500 each, free.		
12 package slips, 500 each	12 00	
2 booklets, complete with envelopes and circular letters, 1500 each	75 00	
2 circular letters, Nos. 1 and 5, 500 each	9 50	
2 " " " 2 " 6, 1000 each	15 00	
1 " " " 3 " 200 each	3 00	
1 " " " 4 " 800 each	5 50	
(Above prices include envelopes.)		
Postage on 2500 booklets (500 are for counter distribution)	25 00	
Postage on 4000 letters	80 00	
Prizes in amateur photo contest	20 00	
Window expense (estimated)	104 00	
Contingent fund to cover all other advertising expenses	111 00	
		600 00

With this knowledge of the advertising matter that is to be used, the next thing to be done is to begin preparation of copy. Time will be greatly economized by preparing say a three months' supply of newspaper advertisements (thirteen) at one sitting. Without waiting for inspiration.

collect the data, consisting of all available information, get away somewhere free from interruption of any kind and plunge into it. A task of this kind requires intense mental concentration, but once concentration is secured it is not much harder to write ten advertisements than two. Of course the same is true of the booklets and other matter to be written, and all should be prepared six weeks or two months before they are actually needed.

Besides the saving of time, this gives ample opportunity for revision and improvement, as new ideas occur to you, and they will occur. Looking over your copy a week or two later you will see how it can be strengthened and improved in various ways, so that when you hand it to the printer it will not be the weak, ill considered sort that is usually seen, but will have the strength, completeness and individuality necessary to effectiveness.

RECORD BOOKS.

In order to have a perfect bird's-eye view of the advertising campaign at any time it is necessary to go to a little trouble in keeping records. This outline of a campaign is only a good beginning.

A convenient way is to take a loose-leaf memorandum book as large as can be conveniently carried in the pocket, and set off the first fifty-two pages for a calendar of the advertising, devoting one page to each week, corresponding with publication dates of newspaper, or if more than one paper is used and publication dates differ, simply use the calendar week. In this enter all the advertising that is to be done during that week, including of course the windows.

Leave room for notes in connection with each.

Now, reversing the book, begin again at the front and devote a page to each piece of printed matter, each newspaper advertisement, each window display, etc., and outline the matter for each. You will have frequent occasion to make notes, adding something to this or that page, strengthening your copy or improving a window display. You can also note on such pages remarks of customers heard about the article advertised. Some of the greatest department stores are said to give particular attention to gathering data first hand from things said by customers and reported by salespeople to the advertising manager.

When you come to write your copy for the next three months you will find this book a veritable mine of ideas and information. If you have used it to jot down your ideas, reference to journals or books where you have come across something appropriate, and the suggestions of your clerks.

Finally, every advertiser should know just what he has done. An ordinary scrap-book should be provided in which each newspaper advertisement is pasted; also every other piece of printed matter issued by the store, and kodak photos of window displays used each week, with a de-

scription of the window, time it was used, and noticeable results of any kind. This is history, and the value of such a record will be appreciated the following year. Direct results from any piece of advertising should be recorded for that matter as a guide for future work.

With these two books, a sense of advertising, and the moral stamina to keep up the work, even though it may at times be a trifle irksome, no druggist with an average amount of judgment will have any difficulty in introducing system into his advertising. I feel safe in saying that anyone who will try it for a year will never be tempted to drop back into the old, careless and inefficient way that is so much in evidence at present.

The Chair here stated that he wanted to change the order of the program a little, and introduce in very brief abstract a paper by Mr. John F. Patton, an ex-President of the Association, on the subject of selling spices and flavors. He would read a short section, to show the application of some samples which he proposed to pass around among the members. Mr. Mason then read from the paper to show how, according to the author, a profitable business might be secured with the rural population in the sale of black pepper, coarsely ground, during the hog-killing season, etc. The full text of the paper is here given:

SELLING SPICES AND FLAVORS.

BY JOHN F. PATTON.

It is pretty generally recognized as a fact that the sale of these condiments is no longer in the hands of the druggist. And yet it is well within the memory of some of the older men in the business that this trade was almost exclusively in their hands.

Endeavoring to get this trade back into its legitimate channel suggests a few thoughts on trade conditions. There is but little satisfaction in seeking to learn the cause of the departure of so much of the trade once almost exclusively ours. The fact remains that others now exploit the field in certain articles which the druggist once claimed as his own.

As spices and flavors are properly a part of pharmacy, entering into many medicinal compounds, it seems natural that the druggist should be the purveyor of this class of goods to the general public. Besides, his education and training make him better fitted to judge of the quality of the spices he offers for sale than the average groceryman, as he is certainly better qualified to prepare the various flavors used in the household than the dealer in sugar and coffee.

It is certainly more satisfactory, as it is more ethical, to furnish the sale of such articles so closely allied to pharmacy, and which have always been regarded as a legitimate part of the drug-store stock, than those other goods bearing no relation to the business. These days of the over-supply of drug stores, with its corollary of keen competition, have brought about a condition of degrading pharmacy in the multitudinous variety of wares

styled side-lines now so generally found in drug stores. The drug store whose existence depends upon the profits accruing from the sale of these goods whose character is so totally foreign to pharmacy, is, we fear, having notice served on it by the public that as a pharmacy it is no longer needed. Superior quality is the one thing that ought to differentiate drug-store spices and flavors from those of other dealers.

The superiority of an article is that which lays the strongest hold on memory, whilst the price paid is soon forgotten. There are people in every community to whom the quality of an article more strongly appeals than the low cost—quite enough such people, if properly handled, to make a very good spice trade for the druggist. Having the goods, the next thing is to bring them to the attention of the users.

Sampling, to be effective, ought to be sufficiently liberal and in attractive form to make an impression. Put specimens up in glass-stoppered bottles in a neat case, with printed matter giving a brief historical sketch of each spice and the mode of preparation of each flavor, and you will at once enlist interest. These samples, placed in the family where you know they will be appreciated, remain in the household as a perpetual reminder of your store and the excellence of your stock. The cost of this way of advertising isn't so much to be considered as the permanent character of it.

To those who have a trade with the rural population, a profitable business can be secured in the sale of black pepper during the hog-butchering season. Granulated potassium nitrate and coriander seed also go along with this sort of trade. The ordinary ground pepper, with its coarse particles and fine dust, is undesirable, and if your pepper is granulated of uniform size it appeals to the user as something out of the ordinary and is eagerly sought.

Our sales last winter of granulated pepper, a sample of which we submit, amounted to eight hundred pounds, and our supply was exhausted before the season was over. Each season for the past few years has witnessed an increased sale of this article.

We send samples out in small cylindrical wood boxes bearing this label:

SAMPLE PURE BLACK PEPPER.

Ground for country butchering. This quality of high-grade pepper is sold only at PATTON'S CITY DRUG STORE.

Remember this: When you buy low-priced PEPPER you are paying for high-priced DIRT.

A WORD TO THE WISE IS AMPLY SUFFICIENT.

Every fall we send out such samples, enclosing the latter in a circular bearing the following text:

This condiment is more generally and more largely used than any of the other spices.

There are a great variety of peppers, as well as a great difference in the quality of black pepper.

The best grade of black pepper is the Singapore, grown on an island off the peninsula of Malacca, East India.

All pepper coming to this country, no matter where grown, contains about ten pounds of dirt in each hundred-pound bag.

The pepper grain grows in a pod like a pea, and is threshed out on the ground.

In gathering it up to bag it for shipment, it naturally follows that a good deal of the ground must come along with each shovelful.

Gravel, sand, broken sticks and clay constitute the dirt found in whole pepper as it comes to this country.

As to the amount of dirt and adulteration intentionally put into ground pepper, that depends altogether upon how small a price you want to pay for it.

Besides the foreign matter found in whole pepper already mentioned, those who grind spices for the market are disposed to accommodate all who want quantity and not quality —who want a low-priced and not a pure product.

Hence buckwheat hulls, cocoanut shells, burnt, stale and musty crackers are added to and ground with the pepper. It is pulverized and a little Cayenne is added to make it hot.

All of which means that you fix the price you want to pay and the grinder fixes the stuff.

True economy lies in getting the worth of your money. Buying dirt for pepper is not economy.

We submit a sample of our double-sifted, *absolutely clean* SINGAPORE BLACK PEPPER, coarsely ground for country butchering.

For the past fifteen years we have been selling only this one quality, in both finely and coarsely-ground products.

PATTON, THE DRUGGIST, YORK, PA.

The spice business certainly pays if you go at it right—and it never pays to take anything up if you don't go at it right.

The Chair stated that Secretary Ladish, who was "a live wire himself," would now read a paper of his own upon the subject of "Some Thoughts on a Live Subject." Mr. Ladish eulogized Mr. Mason's efforts, and thought that too much could not be said in appreciation of what he had done for the Section on Commercial Interests. He presented his paper as follows:

SOME THOUGHTS ON LIVE SUBJECTS.

BY E. H. LADISH.

How can we increase our prescription business?

By getting the confidence of the public.

By getting the confidence of the physician.

By using neatness and despatch in filling orders, and lastly by exercising diligence abundantly.

The public must have confidence in your ability. Don't begrudge an investment in some article that is being detailed or circularized. Put it in stock. Many times we have made a very loyal patron in a manner which the following colloquy describes:

"Have you this in stock?" handing over a prescription.

"Yes."

"How long will it take to put the prescription up?"

"Five or ten minutes. Won't you please be seated."

"My! I'm so glad I came here. Our doctor told me that this was something new, and that I might not get it here"

Or people will sometimes say: "I have tried a few places, and they told me I could'nt get it until to-morrow;" and many other like remarks are frequently made.

We are subscribers for all the leading journals that enable us to keep informed on new remedies, and all those from reputable sources are stocked immediately. This creates confidence.

If a person will call later for his prescription, give him a check or take his name and affix it to the container, neatly wrapped, with the price or the word "paid," as the case may be, plainly marked thereon. The writing of the label should be as carefully and legibly done (typewritten labels are the best) as the prescription is correctly compounded.

The utmost care as to clearness of solution, and uniformity in pills, suppositories and powders, will invariably catch the the physician's eye, and don't forget that he looks at most prescriptions! The slightest shrug of the shoulder or the most flitting expression of the face speaks volumes.

A belladonna suppository should not possess the appearance of a layer cake. An extra five minutes on a yellow oxide of mercury ointment may bring you manifold returns. One of the most serious mistakes is the making of tinctures from fluidextracts. This habit will grow and many a pharmacist has lost both the physician's and the public's confidence through this pernicious practice. Lastly, keep well informed on all new articles as well as your materia medica.

Read the pharmaceutical journals! Thus, when a physician or a layman asks you about something that belongs in a drug store, you have at least heard of it.

MAKING COLLECTIONS.

Follow the system that any mercantile house does. Don't extend credit unless the party is reliable. This, of course, opens the subject as to what constitutes reliability. A mere superficial acquaintance does not warrant a person in opening an account. He must have been a resident some time and your observation must be close. A person that can't pay $0.35 or $0.50 for an initial prescription, certainly can't pay $5.00 to $10.00 later on. In an emergency one necessarily will give out goods to presumably good citizens. Impress upon them that you keep no books. Then, upon failure to put in an appearance within a few days, call and present a bill. Don't neglect this.

I have a number of monthly accounts with business houses which, of course, are rendered punctually each month. Notwithstanding all precautions, one will have accounts that get old. Be after them, but whatever you do don't lose your temper and patience. Kindly but firmly

remind delinquents. Don't threaten to do this, that or the other thing, unless you actually mean to do it. Once you tell people you are going to do something, do it!

I've been in business ten years, and during all that time my losses haven't amounted to over $150.00.

SODA WATER POINTERS.

Make it as comfortable and agreeable as possible for your soda customers, and you'll enjoy business. Experience has taught me that a pleasant, obliging, quick-witted clerk does the business. If it's too much trouble to take care of a fountain, throw it out. Start in right. If you have calls for certain drinks, make 'em up and advertise them. I have found that such catchy names as "Howe Street Sundae," "Mohawk Street Quencher," "North Division Frappee," attract attention and get extra business.

Mr. Osseward, discussing the paper, and referring to the author's advice to read the pharmaceutical formulas, said he would also add the Journal of the American Medical Association. If the pharmacist desires to obtain information in regard to new remedies, that is the first place to look for it.

Mr. Sanford, commenting on Mr. Osseward's suggestion as to the Journal of the A. M. A., said if those who took this publication would file and preserve the various issues, in the course of ten or twelve years he would have one of the most useful reference libraries, both for the physician and himself, and also the public, that he could possibly have in his store. He has found that not a week goes by but some question comes up, that ninety-and nine times out of a hundred, can be answered by referring to the perfect index of this paper. He was often enabled to assist the physicians in that way, and this file has proven to be one of the most valuable things he could have in his laboratory.

Mr. Philip said he had made it a rule when he took a dollar magazine to get a dollar's worth out of it. He passes it along to his clerks, and he generally gets a great deal more out of it than he pays for it.

Mr. Mason, himself the editor of a pharmaceutical journal, said that, on behalf of his colleagues present, as well as on his own behalf, he desired to make acknowledgment of the usefulness of the pharmaceutical press.

At request of the Chair, Mr. G. H. P. Lichthardt read the following paper on credits and collections, by Mr. Mittelbach, of Missouri:

CREDITS AND COLLECTIONS.

BY WM. MITTELBACH, BOONVILLE, MO.

In this age of close competition and narrow margins of profit the question of "credits and collections" is an interesting and most important one. When we observe the store doing a strictly cash business we are

tempted to conclude that such a business is the only one. In one sense of the word this is true. A merchant doing such a business knows at the close of each day exactly how he stands. The keeping of books and worrying with collections are unknown things to him. He apparently is getting the cream of business.

A closer study of the subject, however, reveals opportunities to the merchant doing a safe and limited credit business that the cash merchant does not have. In small cities especially, where one can ascertain the character and standing of people, the opportunity for doing a safe credit business is unlimited and the increase in sales and profits is well worth any merchant's time and extra labor in going after. So much business is done over the telephone and through the messenger service by our very best people that it is almost impossible to avoid some credit, if only for an hour or two. Many families will, under a strict cash business, curtail their purchases very much, thus reducing the gross profits of the merchant materially. The margins of loss in a limited and careful credit business are not enough to offset the increased profits of a larger business gained through the credit system.

The careful keeping of accounts is of course necessary, and prompt entries of credit sales upon your books must be attended to. Items charged must be clearly and fully described to avoid any controversy when they are paid for. A merchant that is careful in this matter soon has the full confidence of his patrons, and disputes of accounts very seldom arise. Even in the large cities, an increase in the volume of trade can be gained by the credit system that will add enlarged profits to the business. It is a little more difficult to ascertain the standing of people there, and more care must be taken in extending credits than in the rural communities.

Having sold your goods on credit, the next and very important step is the collection or proper settlement of the account. Promptness and perseverance in going after the money due you is very necessary. Have your patrons understand that at the end of 30 or 60 days you must have your money, and at that time don't fail to send out your collector or mail your bills. Promptness in your demands will not only bring your losses on accounts down to a minimum, but will also add to your standing as a merchant. Large losses and failures in business through a credit system are due to lax methods on the part of the merchant.

To revert to the advantages of a credit system, let me say that the custom of carrying but little money or none at all is growing among the wealthy and responsible people, especially in small cities, and it is quite a convenience for them to be able to step into a store and purchase such things as strike their fancy at the moment. Were they compelled to wait until they got the money, or draw a check at the time, many sales would not be made. It seems to be a pleasure for them to gratify their wishes

without being bothered with a settlement for such at the time. The shrewd merchant catering to this class of trade can build up a fine and safe business and more nearly realize a living profit on his goods than if cash is demanded on delivery of the goods.

The amount you risk on any charge must be judged by the occupation and standing of the individual making the request. In my long experience of doing a credit business, I have come to the conclusion that very few people deliberately plan to beat you. Continued inability to pay a debt makes many people feel like avoiding their creditors, and drives them to other stores. If some poor fellow owes you, and you feel satisfied that he can't help himself, don't drive him from you by continually reminding him of the debt. Rather overlook the matter temporarily, keep his good will, and get the few cents he is able to spend in your line of goods. There may come a time when he will be able to square accounts with you, and he will be grateful for your patience with him. In my long experience I have come in touch with many such characters. I always count on a certain amount of loss through credits, and I place a debtor on the deadbeat list only after I am thoroughly convinced that he can pay but is too mean to do so. Even then such a person can often be brought to rights through the courts. There are a few men that seem to prefer paying a debt through legal channels.

Approach your debtor in a cheerful way. Keep him in good humor if possible. He is more apt to pay under these conditions than if he sees you are dissatisfied or worried. Study the individual. Only a few days ago I made a sale of $4 on credit to a patron about whom there was considerable cause for doubt. I remarked to my clerk at the time that the man has difficulties with his grocer, and that pressure through legal channels had to be brought to bear recently to make him pay. And yet I felt I could trust him. He had never failed me in his obligations. My judgment of the man was correct, for he paid the bill promptly.

A good general rule I would suggest as follows: Always have your bills ready for collection, and have regular periods, say every 30 or 60 days, when you make the rounds. Be prompt in making your demands, making them with firmness, but politely. Don't show displeasure or irritation if you fail the first or second time. Make a third or fourth call, and always with a pleasant demeanor. It costs nothing extra to be pleasant and polite. If you are a judge of human nature—and you should be if you desire to succeed in business—you can readily tell, after three or four demands for payment, whether your delinquent is honest or not. Be slow in coming to the conclusion that you have a "deadbeat" on hand. Then, when you do make up your mind to that effect, promptly place the account in the hands of a collector and proceed to collect by law. Better let the collector have the kernel if you have to use his services. It will teach the offender a lesson. Where you can't reach your debtor in per-

son, promptly mail him a statement. This will reach some people. Generally, though, where the debtor has left your community owing you a bill, it may as well be charged to the profit and loss account. Don't waste too much postage in that direction. You should have seen the chap before he moved away!

Mr. Lichthardt, discussing the paper just read, said he lived in a town (Sacramento) that was saddled with the greatest curse on earth—the credit system. The railroad company there employed about four thousand men, and kept back a month's wages. John Smith starts to work for the railroad company, and he does not get any pay for two months. He comes into the drug-store and wants a prescription filled, or he wants some baby-food, or something else. The pharmacist must carry that man for sixty days. Meanwhile, his butcher's, his grocer's and his wash bills are running up, and he will pay them first, and before the druggist knows it he will owe him $15 or $20, and he will have a time collecting it. He told of a personal experience, how he had attempted to collect an account of seventy-five cents against one of these parties, and his collector was met with the exclamation, "Well, Lichthardt has got a lot of gall to try to collect six bits!" He had to sue him, and the costs were $8.75. Another family that he had trusted, for some months, because he thought they were poor and had sickness to contend with, he found had bought a piano meantime. His advice, based an experience, was, that the nearer the pharmacist does a cash business the better for him. He cannot meet his thirty-day discounts and properly conduct his own business with two or three thousand dollars on the books. He had thirteen years' experience in the drug business, to say nothing of the grocery business before that for years, and he was satisfied the credit system was a bad one. His father had been almost broken up by it in the grocery business, and as soon as he stopped it he began to make money.

The Chair stated that he was once in the retail business for a number of years, and for the past ten years as editor of a pharmaceutical journal he had been enabled to make observations pretty well throughout the country, and was measurably familiar with the methods of druggists, and that there was a great difference of opinion among them upon this question of shall we extend credit or not? In Portland, Oregon, for instance, there was a very large firm that boldly advertised for a credit custom. He had gotten a series of very clever "ads" that they had published in the daily press, and they were openly soliciting credit custom. He personally knew of a good many druggists who claimed, as Mr. Mittelbach did, that if you confine your business to a cash basis you are cutting down your sales. A good many rich people particularly have monthly accounts, and the speaker himself had. The idea is that a man will buy more than if he pays the cash every time, for often he will not have it and will not take the time or trouble to go down street and get it: it puts an obstacle in the

way of the purchase. In answer to Mr. Lichthardt, the Chairman said the druggist must use judgment as to whom he shall credit.

Mr. Bowman said he had had considerable experience in doing a credit business, and especially with the medical profession. He said he did not want the members to laugh. In the past seven years he had kept his losses on physicians' accounts down to less than one per cent. in any one year. He admitted that they were slow pay, and they had to be kept at. Once or twice he had found it necessary to sue. He related some personal experiences of this character. "If you are going to handle the doctors' business," he said, "knowing they are slow pay, you must follow them up; you must keep after them; and if you have to sue, do it. But don't lose your temper." He thought Mr. Mittelbach had evidently spoken of the better class of people in reference to credit accounts. He had had an excellent business at one time in the sale of serums, especially among the Polish laborers in this community, and he had never lost but one account, and that not entirely, for the poor fellow had come in one day and paid half of it, and would probably pay the balance at some future time. His experience with these people had gone to show that accounts with these people are a great deal better than they are sometimes with people who have much money.

Mr. Osseward said there was another proposition in regard to serums: His firm does a large business in this line, and in cases of diphtheria, where the houses are quarantined and the delivery-boy cannot get in, the method they adopt to get their money is to go to the physician and ask him all about the patient, and if the physician guarantees the price he leaves it. When the doctors cannot do that, they sometimes take a chance, but not often, as they cannot afford to credit parties they do not know: in such cases they make a bill of $40 or $60, and never pay it. But if the physician trusts the patient they charge the account up to the doctor for the time being, and the doctor collects it.

Mr. Baldwin cited the case of a very large drug concern in his city that went on a strict cash basis and made a great success of it. They at one time had done a credit business, and had to be closed up.

Mr. Philip said that right after the earthquake they did a great deal of credit business—that they had to do it, felt it was their duty to do it. They were bound to give credit regardless of consequences. They had gradually taken up these accounts, however, and had decided to go on a cash basis, with the result that they had done a large business. He would recommend any druggist to try it.

Mr. Laue thought that both methods were successful. He knew of the store in Portland referred to by the Chairman as advertising to do a credit business; also of other like firms, one of which advertised that they were the largest retail drug house in America, and he thought they were. These firms would advertise that they gave credit, and one house advertised that

they "would give dignified credit." This kind of advertising was not confined to the drug business; he knew of firms that would advertise on the 25th of August, say, that goods purchased on that day would not be due to be paid for until the 1st of October. He had been for many years in the drug business and had always catered to a credit business—for twenty five years or more, anyhow, and his losses had been very little upon the gross business done. He sent out statements three times a month, however, and kept everlastingly after them. His business had been established so long now that people had to ask permission now to run an account.

The Chair called on Mr. Frazier, of Kansas, to say something on this subject, and Mr. Frazier responded that, being a new member, just elected at the last session, he did not intend to say anything, though it was pretty hard for him to keep still. In his judgment, the credit proposition was about the hardest thing the retail druggist had to contend with. It had been his experience that it was hardly possible to abstain from doing a little credit business, and especially in the case of sick persons who had no ready money to pay for necessary medicines. He gets around doing anything but a very limited credit business by having printed on his bill-heads words to this effect: "We conduct our business strictly on a cash basis, thereby giving our patrons the benefit of the very best price possible to obtain, taking into consideration the quality of goods used and the service rendered. But as a matter of mutual convenience, we extend credit to the first of the month following the month in which the goods are purchased to those who have established credit." Mr. Frazier said he had been in business for eight years, and during the time had seen his business grow to very satisfactory proportions, and he had not lost over $50 in bad accounts during the eight years. He thought almost any one of those present would have given away perhaps more than that in that time, where he did a cash business exclusively.

Mr. Chas. Holzhauer said he had been in the drug business for quite a number of years, and he believed in the cash basis as nearly as possible. Of course, the location and circumstances must govern. If a man is doing business in a residential neighborhood of wealthy people, where the head of the house is frequently away from home, it is absolutely impossible to do a strictly cash business. Owing to his own favorable location for doing a general business, he has no difficulty whatever in conducting his business on practically a cash basis. If a man comes into his store and says, "I haven't the money with me, but I will give you my name and address," he will say, "We don't want your name and address, but stop in when you come around again." It is better to lose that sale than to open an account with such people. The way to do business is on the basis of a fair exchange, and the speaker did not believe in the druggist having to hammer and hammer to get his money back for the goods he sells. "The good humor comes from knowing when you make a sale that you have the

money in the till for the goods that have gone out." As to the doctors, Mr. Holzhauer said he never had accounts with them—and he never wanted any! The doctor deals with him as any other person does; he pays for what he gets. No doctor has *carte blanche* in his store. If he wants a soda-water, he pays for it; if he wants a cigar, he pays for it: and he has the respect of every doctor in the town. They do not all send to him, but he would rather have what he gets of that business than to be "eternally catering to them" and trying to get their business. In regard to the credit business, Mr. Holzhauer held that many a man, when he gets $10 on you, will take his cash and go somewhere else to spend his money. You have lost his account and his trade in the bargain. He had quite a lot of customers who owed accounts to "the other fellow" and brought their cash to him.

The Chair reminded the members that the hour was late, nearly six o'clock, and that nominations for officers of the section had not yet been made. He called for nominations for Chairman.

Mr. Francis B. Hays said he wanted to nominate for this office a gentleman who had been in touch with the work during the past year—a man that the present Chairman had himself endorsed as "a live wire," and the Chairman ought to know one when he saw him. He referred to Mr. E. H. Ladish, of Chicago, the Secretary of the Section. Mr. Meissner said he took pleasure in seconding this nomination. Mr. Ladish protested that he could not serve in this capacity, because of other pressing business, but the Chair ruled him out of order.

The Chair called for nominations for Secretary, and Mr. Schneider, of San Francisco, nominated Mr. G. H. P. Lichthardt, of Sacramento, for that office.

Nominations for three Associates on the Committee were next called for, and the Chair stated that plenty of good material had been "liberated" at the session this afternoon. Mr. Wilbert nominated Mr. W. B. Philip, of Fruitvale, Cal., for Associate. Mr. Wilbert disclaimed the wish to make all the nominations, but he was reminded that the Association was to meet in the East next year, and he thought if the gentleman from New Jersey (Mr. Holzhauer) would serve, he would be a valuable man on the Committee. Mr. Holzhauer protested against this, on the score that he had served in the past, but Mr. Wilbert insisted that this was no excuse. Mr. Laue, of Portland, nominated Mr. E. L. Baldwin, of San Francisco, for Associate, but the gentleman said he felt impelled to decline as he was a new member, and the matter was not pressed. Mr. Dyna, of Los Angeles, then nominated Mr. H. G. Dean, of Santa Ana, Cal., and Mr. Meissner nominated Mr. W. J. Frazier, of Wichita, Kansas.

The Section then adjourned to 8 o'clock p. m.

SECOND SESSION—TUESDAY EVENING, AUGUST 17, 1909.

Chairman Mason called the Section to order at 8:15 p. m., and announced that the first order of business was the reading of the minutes of the first session, but that, without objection, this would be dispensed with, as it was purely a formal matter. So ordered.

The Chair then called for further nominations for officers of the Section—for Chairman, Secretary and three Associates. He said nominations for Chairman were first in order. Mr. Ladish nominated W. M. Bowman, of Toledo. The Chair called for further nominations, but none were made.

The Chair then called for nominations for Secretary, stating that Mr. Lichthardt had been nominated for Secretary at the afternoon session. There was no response to the call for further nominees.

The Chair called for further nominations for Associates on the committee, but none were offered.

Mr. Ladish insisted upon withdrawing his own name for Chairman of the committee, and read the names of the nominees as follows: For Chairman, W. M. Bowman, of Toledo; for Secretary, G. H. P. Lichthardt, of Sacramento; for Associates, W. B. Philip, Fruitvale, California; W. J. Frazier, Wichita, Kansas, and H. G. Dean, of Santa Ana, California. On motion of L. C. Diggs, of Los Angeles, the Secretary was instructed to cast the ballot of the Section electing these gentlemen. The Secretary announced that he had carried out this instruction, and the Chair declared these gentlemen duly elected to the offices named.

The Chair said there was a series of papers on the very interesting subject of gaining the support and patronage of the physicians, the first paper by Mr. D. F. Jones, of Watertown. S. D., but the writer was not present. He said it was both an interesting and valuable paper, presenting some novel points of view. The text of the paper here follows:

PRACTICAL METHODS OF GAINING THE SUPPORT AND PATRONAGE OF PHYSICIANS.

BY D. F. JONES, WATERTOWN, SOUTH DAKOTA.

My purpose in writing this paper is to set forth in a practical way what knowledge I have gained along the lines suggested by the title during a period of fifteen years of experience in a town of eight thousand people in the Central West.

I mention these things to convince you that I am dealing with the facts and not with mere theory, which may interest those of you who are located in places of a similar size with perhaps similar conditions.

I am well aware that papers upon this subject are numerous. I have read many of them. Some of them I have found helpful. I trust this paper may strike an average and be helpful to at least a few.

I do not believe it best to take up all of your time in telling you what I have done during these fifteen years, although it might not take long to tell it. I believe it better not to tell so much what I have done, or what I do, but rather a few things that I do not do.

I find from experience and careful observation that there are a number of things I cannot do and still retain the patronage, good-will and confidence of the average physician.

Perhaps I can make myself more clearly understood, at least give you a more clear impression, if I give you a hurried introduction to the style of my place of business.

The front and entrance to my store are neat, attractive and clean, bearing no evidence of neglect or dilapidation, with no appearance of archaism. The window is not allowed to remain dirty or untidy, or the display in it to become stale.

I do not use my show window at any time for the display of patent medicines, neither do I employ my counters or show cases for such displays. While speaking of patent medicines, I desire to say that I scarcely ever permit an advertisement of a patent medicine to appear in a local paper over my name. While a boy, and with an ambition to become a pharmacist reposing in my mind, a friend of mine, an old lady, speaking of my future and calling my attention to a local paper bearing patent-medicine advertisements over the name of a prominent druggist, said: "I hope you will never permit your name to be used so carelessly." It made an impression upon me, and I thank the old lady for that suggestion. We as pharmacists are apt to sell our names too cheaply. I use but fifteen feet of shelf space in my store for the display of patents. I am satisfied to supply the demand and not to create it.

I do not sell cigars or operate a soda fountain. I have neither the time nor space to devote to either; therefore, the best space in my store is not occupied by ice-cream tables and spittoons. I do not have my drug-store looking like a restaurant.

I do not sell paints and wall paper, as most stores are doing in towns of this size. I do not consider these side lines compatible with my drug business.

I do not maintain a news-stand, although such an institution has been advocated recently in many of our drug journals in articles setting forth profitable and trade-pulling qualities. It's all bosh! The profits of that kind of business all go to the American News Company, or to some other place than to the druggist's bank account.

I do not run a saloon business under the guise of a drug-store, neither do I have any regard for the man who does.

I do not display for sale such articles as should go through the channel of the medical profession.

I do not sell narcotics or habit-forming drugs except as prescribed by the physician, although we have no laws prohibiting the sale of them.

I do not pay commissions, as some druggists are in the habit of doing, to physicians.

I do not furnish prescription blanks promiscuously, but rather first ascertain what the physician may desire that he may be pleased by getting what he prefers to use.

I do not meddle with my competitor's business, nor spend my time in trying to convince the physician that I am much better equipped to give him good service than is my neighbor across the street. If I am better equipped, I am sure he will make the discovery. If he is so dense that he cannot, then his patronage is not worth an effort.

I do not continually nag the physician, but rather maintain a dignified position and an independence that every pharmacist should possess. I do not, however, do otherwise than impress him with the thought that I am in a position to be of service, and that it is my business to render him such help as is in my power to aid him in the combating with disease.

I do not invite loafing. My store is open at 7 a. m., and it is understood that I am paying rent for a room in which to do business.

Having enumerated enough "don'ts," I will now mention some of the things I do and which have been helpful to me.

In the first place, I endeavor to keep in close touch with the physician, and let him understand that it is my purpose to be helpful to him in all ways possible. I make it my business to keep up to date in all things pertaining to the dispensing counter, and posted as to new remedies and incompatibilities. I endeavor to stock such goods as the physician is partial to, direct in his line, so far as possible. I cultivate a close acquaintance with the physician and gain his confidence, and in this way acquire information that I make valuable to me.

The window and general arrangement of the store are such as will interest the physician. Such goods as are of special interest to him have a prominent place. I do not forget, however, that I am dealing with the laity also, and I endeavor to interest them at the same time by making my store appear distinct and different from others.

Speaking now of the dispensing of prescriptions and the things of more direct interest to the physician, I hardly think it necessary to say that I employ skilled help only; that my work is done accurately and scientifically; that I have an excellent reference library, and that the prescription department is equipped with thoroughness generally. Such information as the physician most wants I endeavor to be able to supply without hesitation. I have physicians come to me for information pertaining to certain remedies that they desire to use in some serious or stubborn case.

I have distinctive features about the manner in which I do my work. For example, my labels all bear the physician's name, as far as that is possible. The fact of the prescription having been checked is indicated upon the label. I use no string in wrapping. All bottles are capped. I am never

so busy as to neglect any of these details. It makes an impression of carefulness as well as neatness. I place upon the package a sticker, calling the patient's attention to the fact that the medicine is prescribed for his particular stage of the case, and that if more is wanted the physician should be consulted.

Referring again to prescription blanks, I was particularly interested at the Indianapolis meeting of the American Pharmaceutical Asssociation in Mr. Apple and his "square deal" prescription blank—interested because of the fact that a similar blank had been used by me for eight years. It differed only, I think, in the fact that my name did not appear upon the back or any part of it. I certainly would not have the words "take this prescription to— " on any blank I used. I would prefer, always, that the physician use a blank without my name upon it, providing, of course, that it does not contain the name of some other druggist. I do not believe in this way of bidding for business.

I endeavor at all times to keep up to date by reading drug journals and studying such books as are necessary; in fact, I continually study along some particular line of advanced work. I feel that druggists have the fault of being too content and too much inclined to be neglectful of the opportunities for self-education in this respect.

I always purchase such utensils as will aid in my work, and I call the physician's attention to my equipment.

For the past ten years I have been successfully operating a laboratory in connection with my store, to aid in the diagnosis and treatment of disease. It is equipped for chemical, bacteriological and pathological work. I find that it pays, both directly and indirectly. It brings in work from a radius of one hundred and fifty miles. This laboratory is an aid, also, in carrying out the regulations of the pure food and drug laws. I do such work as the physician requires and find that it is appreciated. It gives the store a professional standing, such as cannot, I believe, be attained in any other way. This feature will bring business to your store, and although it may take years to prepare for it, I would advise that you try it and see if I am not right.

I believe that the things which I have mentioned in this paper have to a great extent been responsible for such success as I have gained in attracting the patronage of the physicians of Watertown and the surrounding country.

I can say from experience that I believe there must be a sensible combining of the commercial and professional interests of the drug-store. The commercial is apt to over-develop because of the suggestions and schooling we obtain from the army of commercial travelers who are experts, and the professional side has a tendency to lie dormant or undeveloped because of the lack of contact with the teachers of the professional; it is therefore necessary for us individually to work out our own

salvation along these lines and to develop in ourselves that which will bring us the most good. The American dollar, with its screaming eagle, has been held before our gaze so long that we lose sight of much else that would be helpful, and we all join in the grand lunge that each hopes will place it within his firm grasp.

The Chair said the next paper was one on another phase of the same subject, "Selling the Dispensing Doctor," by Mr. W. M. Bowman, of Toledo. He called on Mr. Bowman to read his paper, which he did:

SELLING THE DISPENSING DOCTORS.

BY WALDO M. BOWMAN.

The selling of supplies to dispensing doctors not only offers a means of profit, but is a certain incentive to keep up with the times and be wide-awake to the advancement of things medical and pharmaceutical.

Necessarily every "drug store" cannot expect to procure a thriving business from this source. Neither can every one work up and handle a large prescription trade with the amount of effort and little attention that is usually given to the business. But for the man who is ready to devote an unlimited amount of effort, energy and attention to his profession, who has pride in his pharmaceuticals and who still believes that the field of professional pharmacy is worth while, the catering to the dispenser is work well worth more care than is generally accorded it.

The causes which have produced the dispensing doctor and resulted in the existence of present conditions are varied. The question has been brought up, argued, and re-argued for so many times that it is threadbare. But we must admit that one of the main causes which have contributed to the heavy dispensing of medicines by physicians has been the utter lack of loyalty on the part of some dispensing pharmacists. They have pirated prescriptions, controverted the advice of the physician, and been guilty of the most extreme discourtesy toward him. Let us hope that these men have been more merchant druggists than pharmacists. The high state of development of the patent-medicine business, together with the sometimes equally piratical "druggist's own" preparations, have had their full share in the matter, and the old claim of the "regular school" that the homeopaths are to blame may be taken into account for what it is worth.

Let these causes be the true ones or not, the fact remains that there has been brought about through a variety of causes a good deal of dispensing by physicians, which, while varying in different sections, different cities and localities, shows little sign of being done away with in spite of the efforts that have been put forth in this direction. This being the case, it would seem that the dispensing of medicines to a greater or less extent by practicing physicians is a fixed thing, which we must recognize and make the best of, and which should be turned to good account by the up-to-date pharmacist.

Probably the great majority of these dispensers have been forced into the matter of necessity through inability in the cities to get support from local pharmacists, and in the small towns by inability to get a source of supply for their patients either good or bad. Having once adopted the method of furnishing medicines themselves, they find it almost impossible to change. In my own city I have taken pains in a number of instances to look into the question at some length and am forced to admit that the claim of the doctor of lack of support is well grounded.

There are a limited number of physicians, including the advertisers, who dispense for a very different reason. They aim to get all of the money from the patient that they can, and sell him medicines while they charge roundly for advice. A few, too, dispense simply because they can not intelligently order the agent they wish to make use of.

But he is here to stay—the dispensing doctor; he is many times a good fellow, a fine man in a social and professional way; a user of medicines and supplies; well able to pay his way and more than willing to meet you half way if you are a reasonable business man. He must have a source of supply. What are you doing about it? Are you sitting down and allowing the business to be corralled while it strays away to a few large houses who make no pretense of coöperating with you or offering you an opportunity of handling their goods? Or is it going to those other firms who strive to play fair with the trade in general and who, I am sorry to say, receive but little thanks for their effort? Or, on the other hand, are you wide awake and ready to get what you can from your professional knowledge and willing to accept gracefully conditions as they exist?

I say to you, gentlemen, in regard to the dispensing doctor, SELL HIM! Go after his business! Place yourself in such a position that he will recognize the possibility of using you to his advantage! Lift yourself out of the plane of the counter-prescriber, and instead of turning your front room into a restaurant, and your laboratory into a kitchen, put your efforts into turning out reliable pharmaceuticals, doing this in an economic way in order that you may sell the dispensing doctor in quantity at a reasonable price! Forget the days of profits figuring into the hundreds per cent., and get down to modern methods. Instead of tying up your capital in a lot of miscellaneous junk, put it into pharmaceuticals and get up ginger enough to go after your dispensing doctor and sell him the things he is using on the one hand, while showing him the things he could use to advantage on the other and which you can furnish him.

The physician who dispenses to one patient may not want to furnish medicines to another, and if he is able to procure from you the supplies he dispenses he will naturally send you his prescription when he wants to prescribe. If he does so, will you? Do you abuse his confidence? The reaction is on. You must be one thing or the other—the counter merchant catering to the general trade without let or hindrance, or the phar-

macist with an ethical duty to the medical profession, the public, and himself. If you expect to sell the dispensing doctor, or for that matter to retain the confidence of the prescriber, you must give him your hearty support and coöperation.

Meet your physician-customer in your store, his office, on the street, and cultivate his acquaintance ; keep up with the procession and ahead of it if you can, so that you can discuss the new things in medicine and pharmacy ; and if he goes to you for advice on some medicament or business be ready to give it. You cannot do this with your dispensatory and pharmacopœia lost in the back room, your materia medica forgotten through disuse, and your journals unopened and unread.

The great trouble is that in the mad rush for business the giant of commercialism has caused too many to lose sight of the professional side, and instead of creating a careful pharmacist has turned forth a neurasthenic nobody who stands with uplifted hands crying for deliverance and refusing to help himself onto the solid ground of Ethical Pharmacy.

Rejuvenate your youth and renovate your store ! I cannot see how we can expect to gain the trade of dispensers, nor how we can hold the confidence of prescribing doctors, when we fill our windows with clap-trap advertising and display unlimited amounts of patent medicines and various cure-alls on the counter and the wall case, and while we flaunt before the general public the fact that we are sole agents for this or that " Good-for everything " product, or have the sole distribution of " a remedy for every disease." It is true that the public wants some of these things and that to fail to supply them is to drive away money and trade ; give the people what they want, but place this merchandise in a less prominent position.

The amount of business in sick-room supplies that would logically go to the retail drug-trade, and is driven away to the large supply houses and department stores, is enormous, and you will find that a selected line of such articles as bed pans, douche pans, irrigators, etc., will in the end afford a larger profit than a like investment of money in any other class of goods of which the pharmacist is the logical distributor, and there is no better way of gaining the confidence of the public and the profession than the carrying of a complete line of these goods. Stop and look at your own stock and at that of your neighbor and see how woefully deficient you are along this line.

Cultivate, too, the confidence of the graduate and professional nurses in your city and neighborhood. If you are so situated that you can do so, open a registry for nurses and favor them in every way you can. Your physicians will appreciate the effort, and the good will of the graduate nurse of good repute and practice is of more value than you may imagine I consider that every nurse on the registry that I have conducted for a number of years has been of more value than columns of newspaper advertising or a considerable amount invested along other advertising lines.

The number of physicians who have become accustomed to calling on us for information in regard to nurses, and who have gradually developed into good customers of the store, has been not a few.

This applies not only to physicians in the city, but also to those in surrounding towns, and we have extended our clientele over a radius of 70 or 80 miles largely in this way. Physicians and nurses alike are large users of such supplies as metal, glass, and rubber catheters, hypodermic syringes, douche bags, water bottles, and other like sundries which should be stocked of good quality and kept in shape. These, too, are goods that physicians recommend to their patients and will send to you for if you can be relied upon to furnish dependable articles.

Now as to straight pharmaceuticals and their sale to dispensing doctors. Remember that your physician is so beset with "detail men" calling on him in the interests of everything medical (and otherwise), from those wanting to interest him in a line of fine chemicals to others offering some combination which will afterwards be advertised to the laity with the statement that "your doctor has prescribed it for years," that to gain his attention you must be both interesting and to the point. Show your physician a clean-cut lot of elixirs, tinctures, syrups and official preparations made with care from select material and put up neatly. You will be able to interest him at once, and if you are careful in your buying and economical in your manufacturing you will find it easy to furnish preparations of these kinds at a price equally as good as the large houses and at a reasonable profit to yourself. The quality of the tinctures and elixirs sent out by some houses and sold to dispensers at a good round price is something that needs only an investigation to prove a leading argument for your use.

The preparation of special formula work of various kinds is a point that deserves attention, for almost all of the larger dispensers have combinations which they are using and would like to have prepared. They offer a good profit to you and, when you have gained the confidence of your customer, you can make them up from his order with ease. Special ointments, as well, will be found profitable, as there are innumerable combinations in this line which have found favor with different men and which do not lend themselves well to extemporaneous productions. These with care can be turned out in good condition with satisfaction on all sides. I have in mind a certain ointment of icthyol and chrysophanic acid which proved a difficult one in the hands of several dispensers, and which with a little manipulation was turned out in good shape and resulted in making a good customer of a man who had been but an indifferent one before.

Special formula suppositories can be turned out easily with a small pressure machine and will find a ready sale as well as bring in new business from your customers. The opportunity in the way of manufacturing is almost unlimited. New remedies are coming on constantly and being

displaced with others again. Watch them and place preparations of the new things in pleasant form before your physician customers. Look after the men of the smaller schools of medicine and get their trade on preparations peculiar to their line of work. Above all things be particular with your technique and do not turn out half-made preparations. Watch your processes and make note of the peculiarities that arise in manipulating different preparations in order that you may avoid trouble on the next lot, and that you may duplicate your preparation on the next lot instead of varying too much in appearance and taste. Don't forget the newer suggested processes, such for example, as the fluidglycerates. Be on the spot always.

As to tablets and such specialties as you may want to handle, let me say that a well-selected line of tablets of some high-grade manufacturer will enable you to meet the immediate demands of the majority of dispensers; the selection is a matter of the locality and class of physicians. But of the large lists of tablets put out by the different houses but a comparatively few formulas are in general demand and need be carried in quantity.

So-called "specialties" you must carry in a fair way. Some are good, some bad, some indifferent. You could'nt carry all of them if you tried and could'nt sell them if you wanted to; so select the live ones and watch your stock. The amount of capital you are willing to risk, as well as the methods of your customers, will have to determine the extent of the general line. Do not fail to keep ever in mind, if you determine to cater to this business, that while it will with proper effort develop into a most satisfactory line of trade, it requires work, study, and unlimited good-nature. Remember that Carlyle said: "Happy is the man who has found his work; let him ask no other blessedness."

The Chair called for discussion on the paper just read.

Mr. Jacob Jesson said that the trouble about the dispensing doctor was that he could purchase from the wholesale houses at practically the same price the druggist had to pay, thereby placing the druggist at a decided disadvantage.

Mr. A. I. Cohn thought one point in the paper was well taken, and that was the advice to look after the small schools of medicine and get their trade. He recalled to mind an experience of his own in former years, where he had a good deal of success in doing work for the homœopathists, a line not generally taken up by pharmacists. He thought it would be a good thing if all pharmacists would acquire some knowledge of homœopathy. They could get a homœopathic pharmacopœia and study it, and do a great deal with it. Many times prescriptions come in to the store for homœopathic remedies, and it would be to the druggist's advantage to be able to dispense them.

In response to an inquiry by Mr. Sanford, Mr. Bowman went into more

details than he had in his paper upon the proposition of trained nurses, and his experience in keeping a register of the same. He said he had kept in his register only the names of graduate nurses. This was a question, however, that was to be determined very largely by the size of the city and other conditions that might exist. He said there was no trouble in getting a list of nurses, who graduated from the recognized schools. He had known of a number of cities where there were but few graduate nurses; but there were many nurses who, though not graduates of a school, were well up in their business, and it would pay to cater to them. His practice had been to get the doctors to give his nurses three trial cases. If a nurse proved satisfactory in three cases she was admitted to the regular list. Of course, if a doctor asks for a certain nurse he always sends him the one he wants; but if he has a surgical case, for instance, he has these nurses listed as to their capability in that respect. This is the class of work they prefer to do, and also the class of cases he has the best reports on. Some of them like surgical work, and the physician naturally wants the best qualified nurses for that work. Mr. Bowman said he used a card-index system, by which he could make a complete record, and if a nurse falls into disfavor with a given doctor, she is not sent to him again, "because it starts up a hornet's nest every time." His system had worked out very well, and he tried in all cases to get "the right peg into the right hole."

Mr. Sanford said there was a good deal of similarity between the West and the East in this respect. They had found in the West that these trained nurses moved about every thirty days, and would have a new telephone and new street number. In his experience it had been a very difficult thing to keep a nurses' register. It was evident that Mr. Bowman had had about the same trouble that he had experienced in California.

The Chair stated that Mr. Osseward, who conducted an exclusive prescription business, had perhaps had some experience in conducting a nurses' directory. Mr. Osseward responded that he had not had such experience, but in his city one of the stores had tried to conduct a nurses' directory, but without much success. In the last year, however, the nurses themselves had formed an association and had proceeded to get out a directory of their own, and that could be found in any drug store. This directory was under their exclusive control, and it seemed to work very nicely. They selected one of their number to act at headquarters and keep a record of each nurse available, and that system had been found to work better than to attempt to keep a druggists' directory of nurses.

The Chair stated there were two other papers on practically the same subject—"How Best to Increase One's Prescription Business," the first by Jacob Diner, of New York, and the other by Mr. Osseward, of Seattle. He said Mr. Diner was not present, but inasmuch as his paper was short, and these two papers were on the same subject, he thought it would be well to

have them both read before the discussion was entered upon; he would therefore ask the Secretary to read Mr. Diner's paper. Secretary Ladish read the paper, as follows:

HOW BEST TO INCREASE ONE'S PRESCRIPTION BUSINESS.

BY JACOB DINER.

Not being conceited enough to consider my methods absolutely the best, I shall therefore only attempt to give my views and experiences with *some* methods for increasing the prescription business. The building-up of a prescription business divides itself into two separate branches—first, your efforts among the medical men; secondly, your work with the public.

FOR THE DOCTOR.

Since the influence of the physician upon the prescription business is of unquestioned importance, we will treat this branch of the subject first. A word from the medical attendant will either send the prescription to you or will forever stamp you as unreliable in the mind of the patient. To gain the good-will of the physician we must adopt as our watchword, Honesty, with a capital H, and never deviate one hair's breadth from it. We must first be honest to the physician by *absolutely* and *positively* refusing to do any counter-prescribing whatsoever. And when I say that, I mean it in the fullest sense of the statement.

Even the recommendation of ready-made preparations should be eschewed, and there must be no subterfuge or mental reservation to beg the question and make the sale, while at the same time trying to make yourself believe that you are ethical and honest. There must be no headache cure, kidney cure, lung balsam, etc., under your own name or under that of some assumed chemical company. As a matter of cold fact, you do not know what is good for your customer's kidney, liver, and other organs, nor do you know what is causing the temporary or chronic distress from which he is suffering; then why not be honest enough to say so and tell him that the man to go to is the physician?

Next in importance in your relations with the physician is honesty and skill in compounding prescriptions. Make it an iron-clad rule not to substitute under any condition. If for some reason or other you cannot supply what the doctor has ordered, communicate with him and tell him why you cannot fill his order as written. He will appreciate it and think far more favorably of you than he would if you resorted to sophistication and subterfuge.

However, beyond the necessity of establishing your *honesty* with the physician, you must incessantly labor to prove your *ability* and to keep it constantly before his eyes. You must convince the doctor and ever remind him of the fact that you are a well-trained professional man, willing

to assist him in the treatment of his cases. Improved methods of administering his favorite drugs; information desired by him on new remedies; general up-to-dateness in your prescription department—then approach should be utilized in appealing to him.

And by no means must you neglect to tell him all about it at every possible opportunity. It will not pay you to wait until the doctor comes to you. You must go to him. You must approach him personally. You must send him pamphlets; give him samples of the products of your laboratory; make suggestions about vehicles and modes of administration, and approach him in a thousand and one little ways which will suggest themselves once your mind is directed into these channels and opportunities are watched for. Keep posted on the modern Materia Medica, and let the doctor know that you are posted.

FOR THE PUBLIC.

The public is influenced in its preferences by three main considerations: (1) Honesty; (2) Service · (3) Price.

The same rugged and unflinching honesty which characterizes your relations with the doctor should be followed in your dealings with the public. If a prescription calls for something you have not on hand, and the procuring of which will take some time, be honest and tell your customer so. He will think far better of you than if he caught you in a lie. In fact, he will gather the impression, and justly so, that you are thoroughly reliable, and that you would rather admit not having the article on hand than to compound a prescription improperly.

As to service, too much stress cannot be laid on it. Ever let your customers realize that you are a gentleman and give them no cause to forget it. Also remember that people coming into a drug-store are more or less in distress, either physical by reason of their suffering, or mental by reason of affliction in the family, and it is up to you to treat them with kindness and forbearance.

In the matter of deliveries you must be very, very prompt. No matter whether the medicine is to be taken at once or next day, the people are in suspense from the moment they call for the physician up to the time the medicine is in their hands—and the druggist should be careful not to prolong the suspense. Acquire a reputation for quick deliveries.

The matter of price does not play as important a part as one would imagine. It is far better that you acquire the reputation of being a *reliable* druggist than a *cheap* druggist. Of course "rubbing it in" should be avoided, but charge a legitimate profit on the material and a professional remuneration for your services. Frequently I have had customers ask me if I did not think I was asking a rather stiff price for a prescription. I remember one complaining about a 25-cent price for 2 capsules, each containing ¼ grain of podophyllin, 2 grains of calomel, and 5 grains

of sodium bicarbonate, the customary price in my vicinity being 10 to 15 cents. I told him that the cost of the material did not exceed 1 cent; that the box cost 2 cents more; and that I had charged him the balance for time spent in weighing, triturating, encapsulating, and for *knowing how*. That man was thoroughly satisfied with my explanation—considerably more so than if I had attempted to lie to him about the cost of the material, and he is a good customer to-day.

Make your customers realize that you are as much entitled to remuneration for professional services as the lawyer or the doctor, *and then earn your professional remuneration by being a professional man!*

Mr. Osseward then presented his own paper:

HOW BEST TO INCREASE ONE'S PRESCRIPTION BUSINESS.

BY C. OSSEWARD, SEATTLE, WASH.

From the above heading we are to assume that a prescription business has already been established, and the question is asked: "How can we increase it?"

Before going into this subject allow me to ask you what kind of a prescription business are you doing? How are you conducting that which you have at present? This is very important, for upon the manner in which you are already carrying on that department depends your success of increasing its output.

Perhaps you are conducting a general drug business, including many side lines, so many, in fact, that your prescription department has been crowded into a small dark corner. Let me tell you, then, that your chances for enlarging your prescription file are very slim indeed, for, to all outward appearances, your side-lines are of more importance.

You could not take care of an increase in your prescription department if it should come. Your competitor across the street also does a general drug business. He, no doubt, handles many side-lines; but, on entering his store, we at once observe that the prescription department occupies the most prominent space. It gives the impression that prescription work is the *main business*, every other department being considered secondary.

This store has better chances for enlarging the prescription file; the proprietor is in a better position to take care of more prescriptions, for he has grown more attentive to this department.

There is still another store where no side-lines are carried—where all the time and attention are given to prescription work. Such a store, I believe, will have the best chance to constantly increase the business. To increase the prescription business we must study its possibilities, be ready for to-day and prepare for to-morrow. We must constantly look ahead.

Prescription business consists largely of details. It is therefore absolutely necessary to give much attention to these minor matters which are

constantly coming up. They need your personal attention. No one can look after them in the same satisfactory manner as the proprietor himself.

The location and appearance of the prescription department should be made as prominent and as pleasing as possible. Make the department the most important in the store. Your stock needs close attention. Endeavor to have on hand whatever your physicians may wish to prescribe or call for. Very often customers are made by having those things on hand which your competitor has neglected.

How is your delivery system? Do the prescriptions reach the sick room as promptly as they should? Perhaps you have not been liberal enough in your delivery expenses, to make deliveries prompt and satisfactory to your customers. If you are working for an increase in your prescription business, make your deliveries prompt; your prescriptions should be delivered with more dispatch than your competitor's have ever been. This is the best and cheapest advertising for your store. You are working for to-morrow. Let your customers talk about your prompt delivery to their neighbors and friends. They will advertise your store if you look closely after your deliveries.

What have you done for the physicians? Have you given them the attention necessary to establish cordial relations? Have you studied their needs or made an effort to be of assistance to them? Are you prepared to furnish them with staining solutions for their bacteriological work, their test and volumetric solutions for stomach testing? Or do you have to tell them that you have paid no attention to such work? If so, you are missing some good opportunities of winning their confidence and respect and you can rest assured that they will try your competitor.

My experience has convinced me that it is expedient for the pharmacist to be familiar with the principles of urinary analysis, and that it is equally important to have a good working knowledge of bacteriology. It brings the physicians to your store. They get the habit, and, if you can talk intelligently upon these subjects, they will respect you, and your standing and reputation will rise considerably with them. You cannot expect their coöperation if you persist in counter-prescribing.

Have your physicians know that no medical advice is given in your store. There will be more cordial relations and more chance for an increase in prescriptions. Do not think, however, that cordial relations alone will bring results. They are only a stepping stone in the right direction. It will be easier for the work to follow, and this should consist of a systematic mailing campaign.

In sending advertising announcements through the mail many subjects can be taken up in turn. Speak about the incubator you have installed for the physicians' convenience, which is kept going day and night. Inform him that cultures can be obtained and will be sent to any place desired. It pays to give information on biologic products.

Remind him that you have oxygen on hand and are prepared to deliver it at short notice. Tell him about staining, volumetric, and test solutions. He may know how to use them but knows little about preparing them. U. S. P. and N. F. preparations should be taken up in turn.

Many things of interest to the physician are constantly coming up. Take advantage of them, for the oftener your name goes to the physician the less apt is he to forget you. Our experience has taught us that to increase the prescription business you must keep at it constantly. There must be no let-up. If there is you will fall back and your competitor will force ahead.

Besides your mailing campaign, there should also be personal visits to physicians. Make your personal campaign upon such subjects as you know will interest the physician. These visits should be brief but to the point.

During the last winter we have carried on a personal campaign of this sort which has resulted in a good increase in business. It consisted in detailing the physicians with certain goods, giving one month to each subject. This was continued for four months—October, November, December and January. The direct results in the articles detailed may not have been so great as might be, but I believe this detail work to be the principal cause for our large increase in prescription work during January, February and March. I will not go into detail about this work, as I have a paper for the Section on Practical Pharmacy and Dispensing, about the articles detailed and the results obtained.

Just a word now in regard to the public. While the physician can assist a great deal in sending prescriptions to your store, especially in the beginning, our experience shows plainly that as soon as the public understands your honest dealings, superior work and prompt deliveries, it is not a difficult task to hold your old customers and gain new ones.

Gentlemen, the field is open to all. The opportunities are the same to each one of us. The difference is here: one has worked for an increase; he has prepared for it and when it has come his way, he has been ready to hold it and take care of it. The other has been unprepared. He has not worked for greater things and he is still wondering why he did not get them.

The Chair invited discussion upon these two papers, and called on Mr. L. A. Seltzer, of Detroit—"which, next to Los Angeles, was the finest city in the country"—who did an exclusive prescription business, very much like that of Mr. Osseward, in Seattle, to start the discussion. He said that Mr. Seltzer did business in a building occupied almost entirely by physicians and specialists, and he was abundantly qualified to give some valuable suggestions along this line.

Mr. Seltzer said he did not know that he was so well qualified to give information upon this subject; that he was still looking for ways to in-

crease his own prescription business. The location that he had for prescription work was a very fortunate one, and he had always felt that whatever success he had had was due quite as much to his fortunate location as to any merit of his own. He was not entirely satisfied that an exclusive prescription business was feasible under all circumstances. His method had been largely personal, and the close contact into which he was thrown with the physicians made it possible for him to gain that personal relationship that would not be possible where the physicians are scattered over a broader field. The doctors would come into his place to see what he had, and he made every effort to explain to them and impress upon them that he was qualified to serve them. In short, the idea was to be square with the physician, and be square with the people, and they would come to appreciate it.

Mr. Jesson said that a great many years ago he had an experience in working the prescription business that might be interesting. He owned a store in a town where there was practically no prescription business. He made up his mind he would go after that business, and he asked three of the leading physicians of the place to go in with him. His friends told him that this would not work out, as he would get no business outside of that of these three men. They happened to be the physicians who had the largest practice in the town, however, and it worked out beautifully. The first year they did a prescription business of something like three thousand. These three physicians not only threw their own business to the store, but they influenced a number of younger practitioners, with whom they came in contact. That condition continued for thirteen years, when two of the physicians died, and he concluded to sell out and come to the coast. Since coming to California, he had not looked for a prescription business; he had done better along other lines—although he was still in the drug business, he said.

Mr. Ladish criticised the statement in the paper of Mr. Diner that "A word from the medical attendant will either send the prescription to you or will forever stamp you as unreliable in the mind of the patient." His position was that the druggist who was fair and square, and treated the people right, did not need to fear anybody. If he does the right thing at all times, the physician cannot, all the time, do him harm. "He can do it sometimes, but not always." He knew of an instance where the physician had lost his patient because he was not fair to the druggist. "If the druggist is fair, and does not overcharge his patient, and stands in the open lime-light, he need not fear the doctor."

Mr. Frazier, of Kansas, on this subject of building up a prescription business, thought it was a thing that had to be very closely watched. Attention to small things he had found to be the greatest factor in the building up of a prescription business, as it was watchfulness and care that established the pharmacist in the confidence of the medical profession.

He was strong in the belief that the druggist, to successfully maintain such a business, must not allow the patent-medicine houses to come in and take him by the throat and tell him that if he will buy $25.00 or $50.00 worth of their nostrums, they will give him a window display and furnish him enough goods to make a fine showing. The druggist should not allow these people to come into his store and take away the most valuable advertising space he can possibly have for his own use; and if he loves his profession and expects to have a prescription business, he cannot afford to do so. Mr. Frazier said he did not know what was meant by an "exclusive prescription business"—whether or not that meant that the druggist refused absolutely to sell any proprietary medicine, or that when they were called for he would go to the rear of his store and get them. In his own town he had not been very well located for a prescription business; he was two blocks from a large office-building filled with physicians, and other stores were nearer. Notwithstanding this disadvantage, however, he had a very nice prescription business, and he believed it had been built up by watching closely these little details he had referred to. He said he had made a "special drive" on sick-room supplies, and had succeeded in building up a very nice business along that line. Another thing he wished to refer to was the matter of prices on prescriptions. He presumed that every druggist was liable in case of a rush to overlook figuring the cost of a prescription which contained some unusually expensive article. He thought the pharmacist should always figure what it cost to fill such prescription, and held that the druggist should be paid a profit thereon not simply sufficient for him to make a living, but that would make him a little money besides. He had found no trouble in explaining to reasonable people why such charges should be made, and once you establish yourself in the confidence of your trade you will have little trouble along that line. "But be sure of your ground—know your business," he said, "and be a professional man and demand respect for your business." He did not believe that the pharmacist's valuable time should be given to the sale of postal cards and soda-water, and other such side lines.

Mr. Osseward, referring to a portion of the remarks of the last speaker, said that he had no patent-medicine in his house at all, and carried no sundries except surgical goods, syringes and the like. In case of a call for "Castoria," for instance, their habit is to make the customer understand that they would have to go out and get it, but will do so as a matter of accomodation. That is the extent of their dealings in anything but prescription work. He said he had found it to be his best advertisement, that he had the reputation of filling prescriptions only. A store in Portland had now started on the same line, and there was a similar store at Tacoma. Mr. Osseward admitted that the first few years it was uphill work to establish a business of this kind, but once established the results were gratifying, and the people would tell the physicians to send to such a store.

Chairman Mason said that of course very few druggists were situated as Mr. Osseward, of Seattle, and Mr. Hynson, of Baltimore, and Mr. Seltzer, of Detroit, and others that might be mentioned. He said these gentlemen did not mean, as he took it, to suggest that every druggist should attempt to conduct his business in that way.

The Chair stated that it was likely some of the gentlemen present had had some experience in advertising to secure an enlarged prescription business. He had known some druggists that had used the circularization method systematically, even for months or a year, had used the newspapers or some other medium to increase their prescription business.

In response to this suggestion, Mr. Frazier said that some of the gentlemen had mentioned personal work among the physicians. That was something that he had never done. In his experience it took so much time to get a talk with the busy physician, whose ear it was most desired to reach, that he could not spare the time to make the effort; consequently, his method of advertising had been to write personal letters to such physicians—or apparently personal letters; mimeograph letters. He had bought a mimeograph when he started in business, and he had gotten more good from it, as he believed, than all the time he could have spent in calling on the physicians in a personal way. He admitted however, that he thought both methods used together would be productive of better results than one alone. Mr. Frazier said he did not believe the retail pharmacists of this country did enough advertising. He himself had done a lot of newspaper advertising—not expecting to catch the attention of the physicians, but the general public, the laity. His subjects had been taken from actual contact with the business, and the matter for his letters had been made as practical as possible, on subjects that occupied everybody, and that were of vital interest as well: This applied especially to the physician. He sent out such letters every two or three weeks, as the occasion might demand. He gave information to the physicians—and usually included the trained nurses as well—on different topics that would interest them most. He likewise included the dentist in this—circularized all of them; getting out letters on topics they were all interested in. The main thing is to find something that will interest them, and then the idea is to keep hammering at it—never to cease hammering. He did not believe in providing the physician with everything he wanted when he came into the store, and doubted whether the confidence and business of the physician could be procured in that way. His experience had shown that physicians were as gentlemanly and as honest and sincere, as a rule, as any other class of men, and he had not found them a hard class to collect money from. He thought the druggists in many cases were responsible for their own troubles with the physicians, by allowing them to come in and help themselves to anything they wanted in the store, charging them little or nothing for it.

The Chair said if there was no further discussion of this subject the session would pass on to other matters. There were two papers, he said, the authors of which were not present, and they would be read by title only; one on "Hints on Handling and Selling Perfumes," by Mr. P. Henry Utech, of Meadville, Pa.; the other on "Drug Stores and Pharmacists," by Mr. E. G. Eberle, of Dallas, Tex. He thought perhaps it would be more interesting to the audience to take up some subject for extemporaneous discussion. He felt sure a number of the members could speak upon the subject of advertising, and said he would call on Secretary Ladish to lead off on the subject of apartment houses.

Mr. Ladish said that in his neighborhood in Chicago there was one building of forty flats, another of twenty, and so on—altogether about eight new flat-buildings. He said there had been a good deal of building in his neighborhood, and he thought it would be a good plan to get hold of some views of these buildings. So he had had some photographs taken, and had sent them out to the trade, with the result that there had been such a demand for them that he had actually and unintentionally gotten into the postal-card business, when his whole object had been to bring people into his store. His place of business was a little off the main street, and it was a good deal more difficult to get these people to come there than if he were more favorably located. He said about the best thing he ever did was to have a bulletin board on the outside, with four sides to it, which enabled him to advertise almost anything. Of course he makes it a point to advertise seasonable goods, in hot weather, soda water, grape juice, lemonade, limeade, etc. At other times he advertises insecticides, corn-cures, foot-powders, straw-hat cleaners—of which he frequently sells large quantities. He also uses the columns of the newspapers for advertising seasonable drugs—at certain seasons serums and the like, for example. At other times he advertises fever-thermometers, septic-cups and everything used in the care of the sick. One thing Mr. Ladish said he would impress upon the druggists was to be prepared to meet the demands upon him. Do not, he said, make a great big claim without anything to it.

The Chair called on Mr. Engstrom, of Pittsfield, Mass., to talk on this line. Mr. Engstrom said he was not prepared to make a formal talk, but he thought square dealing with the public, and using the store window to advantage were about the best advertisements that the druggist could have. He did not advertise in the newspapers, because he had not found it to pay. He considered that the window was the best advertising medium that the druggist could use. The window display should be changed constantly, however, and not allowed to grow stale; change it, say twice a week. His idea was to use a large quantity of the goods displayed, so as to give the public the impression that you have plenty of it. The way to impress the public is to show that you are able to supply them with anything

they may demand. The main thing in advertising is to do it in such a way as to inspire confidence in your statements. If the druggist can make the doctor understand that he is going to give him exactly what he wants, and the public that he has the means to give him what he wants, that is the best advertisement any druggist in the country can have.

The Chair stated that he had in his hand a very fine, tasty bit of advertising, gotten out by Mr. Dean who had just been elected Associate on the Committee on Commercial Interests for next year. Mr. Dean, he said, was located at Santa Ana, near Los Angeles, and he was sure the Section would be glad to hear from him.

Mr. Dean proceeded to throw a "bomb shell," as he expressed it, into the pharmaceutical camp. He said that from the tenor of the remarks here, it would seem that the druggists' whole livelihood depended upon the physician. He deprecated this idea. He had been in the drug business for many years, and for years had worked on that plan entirely. At one time he had worked up a good prescription business; but now he was depending on the people. He held that the average druggist's time was too valuable to bother much with prescriptions. He knew this was "throwing a bomb-shell into the camp," he said, but nevertheless that was the way he saw it. Where he did fill prescriptions, physicians got the very best he had in the shop, and he did not substitute; and he charged what it was worth. "The man who don't charge for his time and labor, don't live up to the full measure of his responsibilities," he said. Mr. Dean did not think much of the newspapers as an advertising medium, and leaned more to circularization and the sending of other matter through the mail. This was expensive, but brought better results. He did not believe, however, in tying down to one form of advertising. House to house distribution was very expensive, as everybody knows, and all druggists cannot afford it. He was especially impressed from his experience with the value of the "opening days," but when the druggist advertises such a day he should make good all his promises to the people, for when they come to the store at such a time and are treated well they will come again. He said he would advise druggists to have an "opening" at least once a year.

Mr. Osseward confessed that he stood in exactly the opposite attitude to Mr. Dean. "He thinks he has got it, and I know I have!" He said he didn't know what the gentleman meant by catering to the physician. His way of catering to them had been to go to them when he began business. His firm was composed of two young fellows without capital and no backing, but simply faith in what they were going to do. They had gone to the physicians and told them what they proposed to do, and asked for their support. They let them know, however, that they had nothing to give away, and the result had been that they had more physicians on their books than all the rest of the stores in his town put together.

He did not know why it did not pay to cater to the physician. He thought it was all wrong not to get a fair profit on the goods and labor performed.

Mr. Johnson remarked that this whole discussion had been along the line of the cities. Mr. Dean alone had spoken for the country pharmacists. He, personally, knew that what Mr. Dean said as to the prescription business in the country was absolutely correct. The country druggists did not get much prescription business. The most successful thing he had ever used by way of advertising was a blanket calendar.

The Chair remarked that the statement of Mr. Dean about a prescription business not paying reminded him of a condition that he ran across when he visited Boston a year or two ago. He said at that time there was a chain of drugstores owned by the James Drug Company. Mr. James was a wonderfully brilliant man. He believed he had a chain of stores with a trade of something like a million and a half dollars a year. He appealed in Boston very largely to the transient trade from the ferries, etc. He wanted his customers to come in and go out quickly. The suburbanites would surge by his store in thousands, at certain hours of the day, and Mr. James refused absolutely to put up any prescriptions during those certain business hours of the day. The Chairman thought that must seem strange to the average pharmacist. It was evident that Mr. James, like Mr. Dean, thought this business was not profitable, and he preferred the quick transient trade. The Chairman explained that he gave this only for information, not that he approved it.

The Chair then called on Mr. W. E. Terrill, of Vermont, to say a few words. Mr. Terrill said he had not been in the drug business for some seven years now, but when he was in the business it was in a town of some seven thousand population. He had found the best results from advertising in theatre programs, from house to house distribution, and from circularization. He explained that the reason he did not remain in the drug business was because he always enjoyed the fresh air, "and plenty of it."

The Chair said that something had been said about the prescription business, and that was an interesting part of the drug business. He had found in the eastern cities that the larger stores were supposed to be getting rich—stores which were supposed to sell goods cheap were charging better prices for prescriptions. The usual method in these big shops in the East was to charge a dollar an hour for the labor performed, and from fifty to one hundred per cent. advance on the cost of the material used. He invited remarks along this line, of whether or not a uniform price on prescriptions should be charged.

Mr. C. F. J. Dyna said he did not think the druggist could possibly make an even rate. The prescriptionist's time is worth a dollar an hour, if not more. Then a profit on the ingredients used must be reckoned at

a liberal advance; he himself usually figured one hundred per cent. On some imported drugs he cut that down a little. He thought it was worth one cent to fill a capsule, outside the work of preparation. There are details of preparation that come up at times that must be figured, and if the druggist does not figure a reasonable profit on his drugs he cannot come out even. The druggist is entitled to something for his professional knowledge, just as the lawyer and physician are. He considered it a serious mistake to permit an inexperienced clerk in the front of the store to put a price on a prescription brought in. This is a matter that should be referred to the prescriptionist or proprietor. This matter of off-hand pricing of prescriptions was absolutely wrong, he thought, and something that he, personally, highly disapproved of.

Mr. Seltzer spoke emphatically for a flat rate on prescriptions. There were times, he said, when the cost might be a little more, but the idea of figuring on the time "and a lot of other frills" in making a price on prescriptions he did not believe was practicable. He had never seen it work, and he very often questioned whether it was done. He could not make it work, certainly. In response to a question by the Chair, Mr. Seltzer said that he was accustomed to charge thirty-five cents for a two-ounce mixture, forty-five or fifty cents for a three-ounce, and fifty or sixty cents for a four-ounce mixture—unless there was something especially expensive to go into the mixture, when he would add ten or fifteen cents more. He said if the N. A. R. D. mark was on it, he would put it up at the same price if he could do so. He would not cut the price. He said he would even make a lower price than he would ordinarily if the article bore an N. A. R. D. price upon it. In that event he would try to put it up if he could, and if not he would simply say he couldn't.

Mr. R. C. Reilly thought the idea was to impress the public that you are going to give them the physician's prescription as the physician has written it.

Mr. Ladish stood for a flat rate on prescriptions, unless there was something exceptional about it as to cost or unless it required a good deal of time to prepare. Experience had shown him that it was sometimes necessary to deviate from the ordinary price. In the case of a complicated and laborious prescription it would be foolish not to charge for the time put on it. He recalled an occasion where a clothing salesman came into his store and asked to have a prescription filled, one that it took a long time to prepare. When he returned and asked the price, and was told that it was $1.25, he was inclined to complain about it, but when Mr. Ladish explained to him the amount of labor bestowed upon it, and asked him the question if he considered his own labor worth less than a dollar an hour, he replied, "That is all right; here is your money." Mr. Ladish said that for many years the prices on ordinary mixtures had been thirty-five, forty-five, fifty and sixty cents, and now that the prices of everything

had increased—the cost of living and everything else—he saw no reason why the prices of prescriptions should not be increased relatively. As an illustration of the increased cost of materials, he cited the case of senna leaves and chamomile, which had greatly increased in price, and yet many pharmacists retail them at the same price as formerly. This he considered one of the greatest mistakes, for the retail druggist not to charge a fair price on his goods. There was no reason why he should retain the same price that he learned when a boy, when conditions had changed so radically. He recalled that when he first went into the business chamomile was worth some eighteen or twenty cents a pound, whereas now it is worth eighty cents; and yet some druggists sell it at the same price per ounce as formerly. Mr. Ladish concluded by saying that he felt that where the druggist worked from seven o'clock in the morning until twelve o'clock at night, and then often had to get up from a warm bed to answer the night-bell, as well as be confined closely to his store day after day and week after week, he thought he was deserving of something better than to be called a robber. There was nothing to it!

Mr. S. K. Sass related his experience in the retail drug business, in which he had started three years ago, with the result that he had built up his business to six thousand prescriptions a year. His custom was to charge a flat rate of thirty-five cents on a two ounce mixture, fifty cents for a three-ounce and sixty cents for a four, and seventy-five cents for a six-ounce mixture—that is, for preparations like solutions of potassium citrate, compound syrup of hypophosphites, etc. Where anything more expensive went into a prescription, of course the patient had to pay for it. Mr. Sass gave some practical illustrations of charges for unusual prescriptions. As to chamomile and some other drugs, he did not buy in large quantities. If a customer complains of a charge, he told them to go where they could get it cheaper—and suggested that they would find it cheap stuff, too. As to his own store, Mr. Sass said he did not display his goods in the ordinary way, but people had come to know his goods were reliable, and frequently came some distance to purchase goods from him. He had tried advertising in the newspapers, and when he started out had advertised in two Polish papers published in Chicago; but he had found that such advertising did not pay. He thought the best advertising a pharmacist could have was the quality of his goods and fair treatment.

The Chair stated that the time had now come for the installation of officers, and asked Secretary Ladish to escort the Chairman-elect to the rostrum. Mr. Ladish performed this office, and brought Mr. Bowman forward.

The Chair stated that it was with a feeling of relief that he turned over the gavel to Mr. Bowman.

Mr. Bowman said he appreciated the fact that it meant good hard work to be Chairman of the Commercial Section. He also appreciated the

fact that Mr. Mason had set a lively pace for him to follow, that he had secured for the Section this year a very interesting lot of papers, and had done a great work for the Section. If he himself should succeed in doing as well, he would be satisfied, and asked for the co-operation of the members. He realized that Mr. Mason had the advantage of him in being personally acquainted with so many of the members, but he asked for their forbearance.

Mr. Bowman then took the Chair, and stated that if there was no further business before the Section he would entertain a motion to adjourn. Mr. Holzhauer so moved, and the Section stood adjourned.

Papers read by title :

HINTS ON HANDLING AND SELLING PERFUMES.

BY P. HENRY UTECH, PH. G.

Upon careful investigation as to which particular department of our business it would pay to push more earnestly than another, we concluded that perfumes were perhaps, on the whole, fully as satisfactory as any of our various side-lines.

The remuneration from them is ample in more ways than one : In the first place, the margin of profit in handling a good line of high-grade perfumes is seldom less than 100 per cent. or better ; and, secondly, when you consider the vanity of womankind on the question of perfumes, the very name is a subject dear to the feminine heart. All that remains for the druggist to do is to exploit some odor that is new or especially fragrant, and I have yet to encounter the woman who was not thankful for the information received and the interest shown.

Surely no other phase of the drug business befits the old adage : " A pleased customer is the best advertisement." We believe and know that it pays to put forth a little extra effort in this direction, and we base our main effort, first, on the question of quality, and, second, on the permanence or lasting properties of this or that particular odor.

It is my opinion that a large portion of the perfume business has been unnecessarily diverted from our field into other channels, such as the department stores, etc., simply because of our failure to emphasize and impress on each and every customer the matter of quality, which in perfumes, as in many other things, is certainly of first importance. Since the introduction of synthetic or artificial perfumes a few years ago, innumerable manufacturing concerns have sprung up all over our great and glorious land who market these goods in tasty, unique packages, with boxes or labels in exact *fac-similes* of the genuine French articles, but in many instances the only resemblance to the original odor lies in the beautifully colored lithograph of the rose or the violet on the label, the packages themselves, in many cases, being worth intrinsically more than their con-

tents. Naturally these products, gotten up in elaborate style, find a ready market through the medium of the department stores, mail-order houses, house-to-house peddlers, etc., and thus, I repeat, knowing these conditions to exist, it behooves the druggist to go into much detail, explain and emphasize the quality of the real article—the kind he sells—with all the force and argument at his command, for this kind of competition is certainly not legitimate once the true difference is demonstrated to the customer.

The next thing needed in order to sell perfumes successfully is to know perfumes—not simply have an acquaintance with the printed labels (which is the sum-total of many a salesman's knowledge), but a thorough conversant knowledge of the subject. Let the druggist investigate their method of manufacture; ascertain how florescences or concrete perfumes are made; look up some of the more commonly used synthetic bases, which form such a large part of the more popular odors, so as to enable him to discuss perfumes intelligently with his customers. The knowledge thus obtained serves a two-fold purpose: it increases your general sales and it impresses the patron with the fact that you are something more than the ordinary merchant or salesman.

The proper keeping of one's stock of perfume is also important. Considerable time and expense are consumed by the manufacturing perfumer in getting up suitable wrappers and packages, in order that the contents shall reach the purchaser in the very best possible condition. Yet all his efforts count for naught unless we employ the same precautionary means in the proper handling and storing of the packages as soon as they come into our possession. Light has a very deteriorating influence on perfume, and constant exposure thereto very materially alters its character, while direct sunlight, as is well known, completely oxidizes many of the finest synthetic odors, rendering them almost entirely unfit for sale.

It pays to focus your attention on special odors, and we have been very successful in promoting quite a sale on several of these in times past. By purchasing in large quantities or in bulky packages, which a good sale enables one to do, an extra discount is generally obtainable, and this also brings down the cost and increases the profit. In one instance recently we sold several gallons of an entirely new odor, realizing a profit of about 150 per cent. on the transaction.

One of the very best methods we have ever found to promote the sale of a new perfume has been the use of small perfumed blotters, with some neatly worded catch-phrase imprinted thereon. These are carefully inserted in all packages leaving the store. Upon reaching their destination they are generally inspected by the different members of the family, and if the odor is a pleasing one, the souvenir is usually preserved in milady's boudoir, and later a sale almost always follows as the result. We have tried various other methods, such as perfuming theatre programs, sending

out invitations, etc., but they have not brought the returns for the investment which the small blotters have yielded.

By following out the suggestions herein noted regarding the perfume business, the druggist will receive daily dividends in money, profit and satisfaction.

DRUG STORES AND PHARMACIES.

BY EUGENE G. EBERLE.

It may not be popular in this country to think of a drug store without a prescription department; we do not, however, give much concern to a drug store in which this department is practically ignored, and side lines constitute by far the greater portion of the business transacted. Regardless of how few the number of prescriptions compounded quite an investment will have to be made to fill even these. On the other hand, the opposite condition exists where side lines, though carried, either on account of lack of interest or not knowing how, are in reality of no pecuniary profit to the store. It has frequently occurred to the writer that there are many towns in which, if harmonious co-operation was evident, this business could be adjusted to the satisfaction of these competitors by having the prescription work directed to one of the stores, and this one would discard the side lines.

It is a subject that will bear discussion not only from a commercial aspect, but for the promotion of pharmacy. It is a difficult matter under prevailing conditions to exact qualifications commensurate with the calling, because the cry would go out that persons are legislated out of business. A patient does not give the matter of capability much thought until perhaps he needs the services of the pharmacist, and then friendship blinds his judgment. Under present-day methods we are endeavoring to further pharmacy and elevate the standard, but we do not give sufficient thought relative to those who enter the drug business. The soda water clerk or bottle washer develops into the prescription clerk.

Laws even at the present do not regulate the sale of drugs and medicines, but are intended to ascertain the qualification of the compounder. Why not then have legislation which will make a distinction and exact from the pharmacist a sufficient knowledge to safeguard the public, and which will contribute to the advancement of pharmacy? The druggist should pass an examination evidencing a familiarity with drugs and medicines, but should not be permitted to sell poisons (except insecticides, paints, etc.), nor compound drugs. This looks like going to Europe for ideas, but it certainly seems to have advantages that will contribute to the progress of pharmacy. It will be a more effective means of controlling sales of narcotics, for the requirements of a pharmacist could be made more stringent.

While I have not arranged data, the subject of profit has been considered and should not prove a stumbling block. Sentimentality will of

course be in evidence, but this will disappear with adjustment and adaptation of such plans. Arrangement could be made whereby drug stores could have prescriptions filled, that come to them, by the pharmacists, on a commission basis. Without a radical change of this kind it will be a very long time indeed before we may expect to approximate our desires for improved pharmacy abreast with the practice of medicine.

A business man discards a side line when he finds that he can not make it profitable, but he holds on to the prescription business, even if he can readily prove to his satisfaction that it is a loss to do so. He makes no effort to improve it by giving this department the attention it is entitled to from a professional standpoint and many times prefers a prescription for a proprietary because it requires no labor or thought, he shudders when a prescription for a pill comes in that he does not find in his stock, and one for a suppository makes him wish he had chosen some other occupation.

Then there is the other man who abhors sidelines, seldom makes profit out of them, but who is devoted to pharmacy and properly conducts this department, still he retains the side lines not because they bring him profit but on account of being sold in other drug stores. Would it not be better to have a separation, we have surgeons, practitioners of medicines, etc. Specialization is part of the system of evolution.

MINUTES

OF THE

SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION—WEDNESDAY MORNING, AUGUST 18, 1909.

The Section was called to order by Chairman Joseph W. England at 10.30 a. m. Secretary Chas. H. LaWall was absent and F. P. Stroup, of Philadelphia, acted in his place.

Chairman England asked Mr. C. Osseward, of Seattle, associate on the committee, to take the chair while he read his address:

ADDRESS OF THE CHAIRMAN.

Fellow Members: In the report of the United States Commissioner for the year ending June 30, 1908 (Vol. 2, p. 772), recently issued, the following statement is made:

"The whole number of students in medical schools of all classes in 1908, according to the table at the head of this chapter, was 22,787. This is a decrease of 933 from the number of the preceding year and a decrease of 4,275 in the last five years. The number of students in the so-called regular schools of medicine was 21,237; in homeopathic schools, 1,034; in eclectic and other schools, 516. In each of these classes there was a decrease from the preceding year. There has been a decrease in the number of medical students each year for the last five years. The homeopathic students in 1908 numbered only about one-half as many as there were eleven years before, in 1897, and fewer than there were thirty years before. The number of medical schools also has diminished somewhat, there having been 152 schools in 1906–7 and only 149 in 1908, while five of these give only the instruction of the first two years. A few schools have lately been discontinued, and others have been consolidated, in Kansas City, Indianapolis, Cincinnati and Columbus, Ohio, in Minneapolis, and in Louisville, Ky. The course of the first two years in medicine is now given in the State Universities of North Dakota, Oklahoma, Utah, West Virginia and Wisconsin. The whole number of graduates in medicine in 1908 was 4,802, fewer than there were fifteen years before. While the endowment funds of medical schools reporting still aggregate less than $3,000,000, the amount is larger than ever before, though a few schools with the highest endowments did not report this item.

"In pharmacy the trend is opposite to that in medicine and dentistry. While there is a constant decrease in the number of medical and dental students, there is a considerable increase in students of pharmacy, the whole number being 5,567, or 520 more

than in the preceding year, and larger than it has ever been before. It is probable that this increase, like that in law and dentistry a few years ago, is more apparent than real, so far as the number of persons entering the profession of pharmacy is concerned. Instead of young men depending entirely upon shop experience for their knowledge of pharmacy, as was the custom very generally not many years ago, it is probable that more of them now enroll themselves in schools of pharmacy, where they expect to receive systematic and valuable instruction in a much shorter time than when behind the counter. If this be the correct explanation of the increased number of students in pharmacy, there will probably be a more competent addition each year to the pharmaceutical profession, but only about the usual quota of new members. This explanation is sustained somewhat by the nearly constant increase in the number of schools of pharmacy, there being seventy-five in 1908, or four more than in any previous year."

There are given, also (Vol. 2, p. 777), comparative statistics of the professional schools of theology, law, medicine, dentistry, pharmacy, and veterinary medicine, of this country, for thirty-eight years past, by five-year periods, which show the number of schools in each group, the number of students and the number of graduates. The showing is a most remarkable exhibit of the development of these schools within these periods, and completely refutes the thought sometimes expressed that the development of professional schools has reached its zenith. On the contrary, they have apparently just started to grow. Take the schools of pharmacy, for example: the number of schools in 1875 was 14; in 1885, 21; in 1895, 39; in 1905, 67; and in 1908, 75.

The number of students in 1875 was 922; in 1885, 1,746; in 1895, 3,859; in 1905, 4,944; and in 1908, 5,567.

The number of graduates in 1875 was 208; in 1885, 396; in 1895, 1,067; in 1905, 1,518; and in 1908, 1,529.

It is interesting to note that out of the seventy-five schools there are only nine that have less than twenty-five students; in fourteen there are over 100 students, and in one school 495 students. (The general average is nearly 75.) One state (Ohio) has six schools with a total number of 288 students; another state (Pennsylvania) has four schools with a total number of 958 students.

The seventy-five schools represent thirty-five states, and in twenty of these states there is more than one school, clearly showing the need of merging the smaller and weaker equipped pharmaceutical schools into a lesser number of well-equipped and strong institutions.

There is no real need for 75 schools of pharmacy in this country. One-half this number could do the work better than now. Few of the schools receive endowments or state appropriations, and if the smaller schools were merged, their facilities for instruction would be increased, their instructors better paid, and the general conditions of pharmaceutical education distinctly improved.

With the advance in general education, more of the young men and women than formerly who take up the study of pharmacy realize the necessity of collegiate training, but there are large numbers who do not, and the query is, "How may these be induced to attend a college of pharmacy?" The answer seems to lie in several directions: first, more states should amend their pharmacy laws to require that all applicants for examination as pharmacists shall be, as a prerequisite, graduates of accredited schools of pharmacy; second, all applicants for examination as assistant pharmacists shall have attended, as a prerequisite, one term in accredited schools of pharmacy; and third, the conditions of the practice of pharmacy should be made more attractive to young men and women.

So far, only three states have prerequisite laws for pharmacists, and none for assistant pharmacists. The three states requiring the former are Pennsylvania, New York and Rhode Island. In Pennsylvania the result of the pre-requisite clause has been to raise

the caliber of those applying for the examination as pharmacists, and indirectly, it has increased the percentage of college students among the applicants for examination as assistant pharmacists to about 75 per cent., from a much lower percentage, because many such expect to become proprietors, and know that as a prerequisite for such examination they must be graduates in pharmacy, and hence, must attend a college of pharmacy. What the result has been in New York and Rhode Island your Chairman does not know, but the result in the Keystone state has been particularly significant.

It must not be forgotten that examinations, at the best, form only an imperfect test of knowledge. They are in no sense a substitute for the systematic, comprehensive training of the schools of pharmacy; and every state pharmacy law should contain, not only a pre-requisite clause for pharmacists, but also, one for assistant pharmacists. Such a requirement would be most helpful: first, to the public in furnishing more competent service; second, to pharmacists in securing more competent help, and last, but not least, to the assistants themselves in advancing their standing and recompense.

One of the most progressive steps ever taken by the State Boards of Pharmacy was the requirement adopted over five years ago by the Pennsylvania State Board of Pharmacy, and followed by some other State Boards, that practical examinations would be required of applicants for examination, and this requirement should be demanded by every State Board in the country. Pharmacy is both an art and a science, and it is most essential that the candidate should demonstrate his fitness for practical work as well as his theoretical knowledge; otherwise he is valueless as a practical man.

It is interesting to note that the medical profession is realizing the necessity of practical examinations for medical licensure. A recent issue of the Journal of the American Medical Association (1909, 1339) states in part, that:

"An important step recently taken that will have a tendency to raise the standards of medical education is the inauguration of the practical examination by two state examining boards, those of Ohio and Massachusetts. During the written examination, in June, in Ohio, each one of the one hundred and sixty-one applicants was called on, in the presence of the entire class, to make a urinalysis and to identify, under the microscope, histologic, pathologic and bacterial specimens. The results were reported as highly satisfactory. The Massachusetts board required each applicant to give a demonstration on the obstetric manikin and to make a urinalysis, as well as to identify specimens under the microscope. It was stated that many who took these practical tests seemed totally unfamiliar with the microscope. It has recently been announced that with the next few months the boards of Minnesota and Indiana will require, in addition to the written examination, practical tests in histology, pathology, bacteriology and urinalysis. These practical tests have long been required in the medical license examinations of other countries. Their requirement by state licensing boards in this country is, indeed, most important and timely. They enable the boards readily to differentiate the applicant who has undergone merely a cramming process by 'quiz-compend' methods from one who has had training in practical laboratory and clinical work."

Briefly, the present situation of pharmaceutical education in this country seems to need:

(1) The merging of the weaker schools into stronger ones.

(2) Endowments or state appropriations for the maintenance and development of the schools. (Pharmaceutical schools, with but few exceptions, cannot be sufficiently supported on the fees of students.)

(3) The fostering of pharmaceutical education by the state, not only in the matter of appropriation, but also in requiring that a collegiate education shall be exacted of applicants for licensure as a prerequisite for examinations.

A word as to the steps necessary to make the conditions of pharmaceutical service more attractive to young men and women.

There is no doubt that the chief factor that is repelling numbers of the best element of American manhood and womanhood from embracing pharmacy as their life-work is the sixteen-hour a day work, with no time for social pleasure or personal development. We hear much of the eight-hour day for the laborer, but we hear nothing of the sixteen-hour day of the pharmacist. The pharmacist toils in a prison of "brick and glass" every day, sixteen hours a day, seven days a week, without, many of them, God's sunshine and fresh air, in a daily grind with small details that leaves few chances for pleasure or development, wearing out lives before their time; and the pathetic feature of it all is that there is no *real* necessity for such a sacrifice of life. There is no real public need for such long hours. The needs of the sick do not demand it. Their necessities can readily be met, as a rule, during the daytime. The whole root of the trouble is that the pharmacist, in his desire to serve the public, has wrongly taught the latter to expect drug stores, generally, to be open from 7 a. m. to 11 p. m. With proper education of the public, every drug need could be met between 7 a. m. and 7 p. m. (with shorter hours on Sundays), excepting possibly with prescriptions, and these could be filled, if necessary, *after the store had been closed*, the proprietor and assistant alternating for such service, if the business was such as to require two workers, or, if not, the proprietor could remain in the house, for emergency service, *but with the store closed.*

The question of shorter hours raises the question, What of the future of pharmaceutical practice? Will it remain the same as now or change, and if so, how? To a degree, the answer depends upon the future of medical practice, though to a lesser degree now than formerly, and this is directly due to the medical profession itself.

Deplore it as we may, the commercial interests of pharmacy dominate the professional and the responsibility for this condition rests most largely upon the medical profession, which during the past two or three decades, under the influence of the German School of Pathologists, has lost its faith in the clinical possibilities of drugs in the treatment of diseased conditions, and wandered far afield after strange gods in drugless therapeutics.

Prescription writing has become almost a lost art, and as Dr. F. A. Sutliff writes, "Almost no practical instruction as to the best method of combining drugs is given in the medical schools to-day. The therapeutic nihilism of the Johns Hopkins school has gone too far for the good of physicians; our medical faculties seem afraid to teach any real efficacy of drugs, and they send us out into the world afraid to say, 'I know remedies that will really aid nature to effect a cure.'" (N. A. R. D. Notes, 1909, 475.)

And the result of this attitude has been that fewer and fewer prescriptions are being written, and the prescription-work of the average drug store has become a very minor part of the day's work. Because of this loss of income, the average retail pharmacist has been forced to sell side-lines that have no legitimate place in pharmaceutical practice, or starve, and with such an issue, there can be only one outcome.

In addition, it is estimated that fully 50 per cent. of the drugs dispensed in the United States are dispensed by physicians themselves, a condition that obtains, also, in England. On the continent of Europe physicians are by law restricted to diagnosis and treatment, under no circumstances being permitted to dispense; while pharmacists are restricted to the filling of physicians' prescriptions and the sale of simple household remedies, the prescribing for an ailment, even of the most simple kind, being strictly prohibited, under severe penalties.

The number of dispensing physicians in this country is rapidly increasing, and these are buying their supplies chiefly, from physicians' supply houses, instead of pharmacists, thereby depriving the latter of a legitimate source of income.

But if the economic conditions of pharmaceutical practice are bad, those of medical practice are worse, according to the following editorial from *American Medicine* (June, 1909, 294):

"The economic problems of the practicing physician are becoming more serious day

by day. Particularly is this so in the large cities. The average income has shrunk to proportions that make the average weekly wage of many mechanics decidedly attractive, but still the demands for special equipment and apparatus have gone steadily forward. It is probably true that fifty to sixty per cent. of the physicians in New York City—and in many other large cities as well—are not earning fifteen hundred dollars a year. When one stops to consider the modern cost of living in any large city, and the special drains on a physician's income, the hardships that are being encountered by a considerable portion of the profession can readily be seen. That this condition is deplorable, that it hampers medical progress and independence, and that it exposes many good men to innumerable perils must be admitted. It is not right, and there is a flaw in the system somewhere that will allow so many bright, clever young men to work like beavers for four or more years to fit themselves for a lifework, only to find that at least half of them cannot make a living sufficient to suitably support a home and family.

"Many different reasons have been suggested for existing conditions. Every one who has given the matter serious thought sees in some one evil or particular condition the exact cause of the present low ebb of medical incomes. To one the growth of free hospitals and dispensaries is at fault; to another it is the growth of new 'schools' and 'pathies'; and to still another it is the development of state and preventive medicine. In a sententious letter to the writer Dr. Beverly Robinson, one of the most thoughtful and capable physicians of America, whose opinions are always worthy of the deepest respect, ascribes present-day conditions to the overgrowth of specialism.

"What of the future? It is foolish to get pessimistic or panicky. There must be solutions for the problems presenting, and like all other questions that have arisen in the unfolding of civilization, these disagreeable situations will adjust themselves. Whether every medical man is destined to be an employee of the national or state government, or whether the socialization of the medical profession as suggested by that brilliant Irish philosopher and dramatist, George Bernard Shaw, is to take place, no man can tell. It is possible, as Benedict has recently suggested, that we can educate the people to pay us a yearly retainer, with a view of inducing them to come to us to keep them well, rather than to utilize our services only when they are sick. No matter how the problem works out, it is certain that the members of the noblest, cleanest and most unselfish profession on earth will be found ready, keen and fully equipped to fit into any place that society provides or the exigencies of civilization demand, and it is entirely safe to predict that the medical woof and warp that are woven into the social fabric will contribute their full share to the strength and utility of the whole. There is something about medical training and aspirations that make every physician responsive to his duty in a way that the followers of other callings rarely understand. History has proven this in every great crisis that humanity has been called upon to meet, and so there is no little satisfaction to be derived from the fact that despite unfortunate economic conditions that will require time for their adjustment, the individual physicians whose fortunes and well-being are most involved are to-day better equipped and prepared to cope with the ills of mankind than ever before. Herein, thank God, lies the safe and certain future of scientific medicine."

But, the causes of the untoward condition of medical practice in this country are due, not only to therapeutic nihilism, drugless therapy, and the overgrowth of specialism; they are due, also, and very largely, to the outgrowth of medical schools. These latter are entirely too numerous, they strive too strenuously for students, and they send out graduates far in excess of the medical need of the public.

The same charge may be brought against the pharmaceutical schools, but this is not true to a serious extent, because the graduation of pharmacists has not been required by state acts generally, and there are numbers of practicing pharmacists who have not had a collegiate training.

Further, while there are too many physicians, and too many drug-stores, oddly enough there are too few competent assistants, a condition which, states the "Bulletin of Pharmacy" (April, 1909, 137), "is partly explained by the fact that in America every man can aspire to a higher position in his own calling, and clerks have responded to the situation by leaving the ranks of employees to become proprietors themselves," and "partly explained by the fact that most of the pharmacy laws make no distinction between a clerk and proprietor. Both take the same examination; both get the same sort of certificate; both have the same privileges. If, now, the requirements imposed upon proprietors are gradually increased, the number of drug-stores will be held somewhat in check. If, on the other hand, the requirements exacted of clerks are kept lower than those for proprietors, there will be relatively more assistants and fewer store owners, since it will not be so easy for the first to attain unto the position of the second."

It is true, also, that if shorter hours of work, and better wages than now obtain, could be offered to assistants, it would do much to attract the right kind of young men and women into pharmaceutical service, and also, to lessen their anxiety to go into business for themselves.

But, the ability of the retail pharmacist to do this rests primarily upon improved conditions of the drug business, and especially on the lessening of the number of drug-stores; and in this matter, fewer and better schools of pharmacy, higher standards of state pharmacy laws, and more attractive conditions of employment for assistants, will all help greatly; but, in the end, the problem seems to be largely an individual one, to be settled by the law of the survival of the fittest, or supply and demand.

The Chair called for action upon the address just read, and said there were certainly some points in the address that it might be proper to discuss.

Mr. Hays, of New York, moved to receive and refer to the Publication Committee, and this motion was seconded by Mr. Hemm and carried.

Mr. England resumed the Chair, and called for the reading of the Secretary's report as the next order of business, and the Secretary *pro tem.* read the report as follows:

REPORT OF THE SECRETARY OF THE SECTION ON EDUCATION AND LEGISLATION.

Educational problems as applied to pharmacy are gradually being simplified by a closer co-operation between the members of pharmaceutical examining boards and those interested in the various educational institutions scattered throughout the country. The pharmaceutical journals during the past year have contained numerous articles by able and forceful thinkers and writers on the subject of examinations, thus indicating that more attention is being given to it than ever before.

Apparently the high-water mark has practically been reached in the number of pharmacy colleges, for the few new ones that have sprung up have been balanced by the consolidation of two old ones in several instances. The number of graduates sent out this year by the various colleges throughout the country is very slightly higher than the number of last year, and considering that nearly every institution of prominence has made some improvement in its curriculum or increased the number of hours devoted to instruction, it means that there is a gradual and progressive upward movement in the character of the men who are to be the pharmacists of the future, and who are to be the active workers in future colleges, association and pharmacy board affairs.

It is along legislative lines, however, that the most interesting and valuable changes

are taking place at the present time. What might be called experimental legislation has been enacted for years, but it is only since the passage of the Federal Food and Drugs Act of June 30, 1906, that a decided improvement has been observed in the character of the legislation placed upon the statute books of the various States.

It is to the States associations that the pharmacists are most indebted for these legislative benefits, for it is through the legislative committees of these bodies that the greatest power is exerted in this respect. Among the duties which are expected of these committees is that of killing vicious or freak legislation, and a large amount of space might be devoted to this phase of the subject.

So far as constructive legislation is concerned, it will be of interest to consider systematically the work that has been accomplished throughout the United States during the year ending July 1, 1909.

UNITED STATES FEDERAL LEGISLATION AND DECISIONS AFFECTING THE SAME.

No new legislation has been enacted by Congress during the past year, except a bill prohibiting the importation of smoking opium. The legality of the Referee Board has been confirmed, although the sodium benzoate decision has aroused a storm of protest from state officials, manufacturers and various trade and professional associations.

The rehearing on the subject of labeling whisky has not as yet resulted in any definite decision, although the Solicitor-General, to whom the matter was referred, seemed to favor a reversal of the decision rendered by the previous administration.

A large number of notices of judgment under the Food and Drugs Act of June 30, 1906, have been issued, embracing a wide range of prosecutions, many for misbranding or adulterating medicinal preparations. In no instance have the Federal authorities been successfully opposed in the efforts to enforce the law, up to the present time. One of the deplorable features is the lack of publicity in regard to these decisions, as a certain class of manufacturers feel no sense of wrong-doing so long as there is no widespread advertisement of the fact when they are prosecuted.

An important decision rendered during the past year by the U. S. Attorney General, is to the effect that acetphenetidin is an acetanilid derivative, thus making the declaration of its presence in proprietary preparations imperative.

The U. S. Circuit Court of Appeals has decided that misspelled names cannot be registered as names of proprietary remedies.

At the present time the tariff changes have not yet been definitely decided upon. There is no doubt that many minor changes will be made, but none of great importance, unless the proposition to place a prohibitive tariff upon foreign cocaine should be adopted.

Florida. The passage of a new pharmacy law in this State has resulted in the establishment of an annual renewal fee for registration, the raising of the registration application fee to $15, and the elimination of the recognition of a college diploma in lieu of examination.

Illinois. The proposed amendments to the pharmacy law of this State were abandoned on account of faulty construction.

Massachusetts. The pharmacy act was amended so as to provide for reciprocal registration and also providing for suspension of registration for violation of the adulteration clause or for the habitual use of intoxicants or drugs.

Michigan. The pharmaceutical legislation in this State was greatly strengthened by the passage of what has been pronounced a "model" cocaine law, simple in its phraseology and sweeping in its effect.

An amendment to the morphine act was passed, prohibiting the sale by retail pharmacists of morphine in original packages or in pill or tablet form, except upon the prescription of a physician.

Missouri. The existing pharmacy act was strengthened and improved by several amendments. One, of questionable value, however, permits the examining board to accept diplomas of approved schools of pharmacy in lieu of an examination.

An important legal decision in the Missouri courts was to the effect that when a druggist prepares and sells a medicine for a purpose specified by the consumer, he is not guilty of counter prescribing.

An ordinance applicable to Kansas City only, forbids entirely the prescribing of cocaine unmixed with other ingredients.

New York. Much legislative activity has been exhibited in this State during the past winter, resulting eventually in the vetoing by the Governor of the bill which had been passed by the Legislature. The existing law, it is claimed, is defective, and the present method of electing members of the pharmacy board is unconstitutional.

A law was passed affecting the sale of insecticides, providing for their proper labeling and for the issuing of permits for selling these products at wholesale.

A municipal commission on explosives imposed restrictions upon New York City druggists, regarding the manufacture of compounds and preparations containing explosive or inflammable substances.

An important decision in an adulteration case was handed down by a New York judge, who held that articles sold in grocery stores, not intended for medicinal purposes, need not conform to the standards laid down in the United States Pharmacopœia.

Oklahoma. A general pharmacy law was passed possessing no unusual features.

Pennsylvania. Much interest was shown during the past winter, during the biennial session of the State Legislature, in legislation pertaining to pharmacy. A new pharmacy law, permitting deviations from the standards of the U. S. P., where stated upon the label, in everything but such preparations of opium, iodine, camphor, peppermint, etc., as are used for household purposes, differs materially from the former act, where no deviation was permitted under any circumstances.

A new cocaine act containing provisions much more stringent than those in the former law, especially as regards the registration of sales and quarterly reports to the pharmacy board by wholesale druggists, was passed by the Legislature.

Virginia. No new legislation was enacted, but an opinion was rendered by the Attorney-General affirming the validity of the provision of the poison law requiring insecticides to be sold only in original packages.

Washington. Narcotic law, forbidding the sale of cocaine, morphine, etc., to habitues, was recently placed upon the statute books.

Provision is made for revocation of licenses of practicing pharmacists under certain conditions of violation of the law.

The registration of apprentices is made obligatory and itinerant peddlers of medicines are required to take out licenses costing from $5 to $25 per month according to the selling price of the remedy.

Canada. A new law was passed imposing restrictions upon manufacturers of nostrums, requiring a certificate of registration and providing for a serial number and guaranty similar to the Federal law of the United States.

A proprietary medicine is defined as any remedy or prescription put up for sale, which is not in any pharmacopœia or accredited formulary, and which does not bear a published list of its medicinal ingredients.

In addition to the foregoing specific abstracts, many laws have doubtless been passed in the various States, which affect pharmacy in a greater or less degree. The wave of prohibition which is sweeping over the country will have an indirect effect upon pharmacy in many commonwealths. Trade conditions are changing more rapidly than in former years. A higher degree of professionalism is constantly being expected by those who have always looked upon the pharmacist as a kind of walking encyclopœdia and

the pharmacy as a place where many accomodations are to be found. A glance at the papers read during the past year at the State association meetings, will indicate the progress which is being made at the present time, and to those who read between the lines is shown a brighter outlook than has ever been known hitherto.

Respectfully submitted, CHAS. H. LAWALL, *Secretary.*

The Chair called for action upon this very valuable paper, and invited discussion upon it, but there was no comment. Thereupon the Chair stated that, without objection, the report would be received, to take the usual course. So ordered.

The Chair stated that the Section had before it a very important paper by Dr. Hamilton Wright, of Washington City, appointed by President Roosevelt upon the International Opium Commission, which met at Shanghai in 1904. He read the following communication from Dr. Wright:

COMMISSION OF THE UNITED STATES OF AMERICA TO THE INTERNATIONAL OPIUM COMMISSION AT SHANGHAI.

WASHINGTON, D. C., *July 13, 1909.*

MR. JOS. W. ENGLAND, *415 North 33rd Street, Philadelphia, Pa.*

DEAR MR. ENGLAND: Herewith is a paper on the International Opium Commission. I have gone into this work as fully as I can considering we still have an important conference ahead of us. I hope that it will reach you before you leave for California.

I am enclosing a rough draft of a bill that I am working on. It aims to control the use of opium and other habit-forming drugs in this country. I am in consultation with several members of your Association in regard to it. I think there will be no difficulty in regard to Section 2 or Section 3,—or Section 1 for that matter. The tax of one cent an ounce in Section 1 is only provisional, and will be definitely decided when certain data now in the hands of the Treasury Department have been worked out. The difficulty that I am experiencing I have tried to meet by Section 4. It will be impossible to impose a revenue tax on the original manufacturer and again on the compounding pharmacist; but it seems to me that if the compounding pharmacist is simply required to stamp these drugs so as to denote that the internal revenue tax has been paid by the original manufacturer, it should be satisfactory to him. and will give the Bureau of Internal Revenue the necessary powers of inspection to determine the amount of the compound manufactured and its destination. The bill is a revenue measure designed to secure publicity, and is not designed to enforce a moral principle. That will have to be left to the State and municipal laws. The bill, if passed, will furnish the federal authorities with data as to the manufacture and distribution of these drugs.

You might look over this bill yourself, and submit it to members of the Association that are interested, and let me have an extended opinion as to how it should be modified. There is no intention to impose an onerous duty on the manufacturers, because I think it is quite clear that they are averse to the illicit traffic of these drugs.

Yours very truly, HAMILTON WRIGHT.

At request of the Chair, Mr. Thos. P. Cook, of New York, read the report submitted by Dr. Wright as follows:

Mr. President and Gentlemen of the American Pharmaceutical Association:

In discussing the work of the International Opium Commission one is faced with

difficulties, mainly, that, although the Shanghai Commission has finished its inquiry into the opium problem and has reported, there remains a most important work still to be done. That is, the Shanghai declarations to be presented later, must be conventionalized so as to place the production, manufacture and distribution of opium under international control. To effectuate the Shanghai declarations it will be necessary for the powers concerned to meet in conference and enter into an agreement that will satisfactorily control the production of opium, as well as its use. Such a conference is now being considered. Therefore the diplomatic aspect of the opium question can only be lightly touched upon in this paper.

As you are probably all aware, the Shanghai Commission developed from an opium problem which our own government had to face in the Philippines. It was found, on our taking possession of those islands, that the Chinese population was addicted to the habit of opium smoking, and that the habit tended to spread from the Chinese to the Philippine population. Where it did so whole communities were corrupted and economically ruined. Before attempting to settle the Philippine problem, the government of the islands appointed a commission which made a thorough study of the opium question in the Far East, and reported in 1904. As a result, restrictive legislation was enacted, and finally prohibitive legislation, which went into effect March 1, 1908. From 1843–1898, the distribution of smoking opium in the Philippine Islands was through a farm—the Spanish government selling the farm to the highest bidder. Statistics for these years are not accurate, but it is stated on good authority that the Spanish opium revenues in the Philippine Islands rose from 81,532 Mexican dollars in 1863 to 250,463 Mexican dollars for the first half of 1897. Smoking was confined by law to the Chinese population, but the law was not strictly enforced, and, as stated above, many natives contracted the habit and were thereby ruined. There was a transition period in the Philippines from 1898 to 1901, that is, between the American occupation of the islands and the establishment of civil government. The importation of opium into the islands was under the provision of the Dingley Tariff, with which you must all be familiar; crude opium was dutiable at one dollar, and smoking opium six dollars per pound. During this transition period no attempt was made by the islands government to control the use of the drug. The effect of this was inevitable. Cheap and easily obtained, the use of opium spread. The importations for 1899 were 91,000 pounds, and for 1900 over 155,000 pounds. The Tariff Revision Law of the islands, of 1901, imposed a duty of $3.00 per kilo on crude opium, and $3.50 on opium manufactured for smoking purposes. In 1905 the importation of all kinds of opium was over 268,000 pounds; the highest figure reached was in 1902, when it rose to over 285,000 pounds. In the latter year there was a severe epidemic of cholera in the islands, and it is claimed that opium vendors used the opportunity to increase the sale of opium among the Filipinos as an antidote or cure for the disease. Thus it will be seen that under the American occupation, and in spite of the increased impost on the drug, the demand for it grew, and marked a wide-spread use of opium for illicit purposes. The commission appointed by the Philippine government to study the question presented its report in June, 1904, and, as a result, prohibitory legislation was finally passed and became effective in March, 1908. The prohibitory law in the Philippines has meant a considerable financial sacrifice to the Philippines' government. The total revenue of the islands for 1907 was over $17,000,000, six hundred thousand of which was derived from the import tax on opium. Thus, practically three per cent. of the total revenue of the islands has been sacrificed in the great work of suppressing the illicit use of the drug amongst the Chinese and native populations. The Philippine report undoubtedly influenced the anti opium workers both in England, the United States and China. That its influence on the mind of Lord Morley was profound is shown by the following quotation from his speech in the House of Commons in May, 1906. He stated, in support of a resolution condemn-

ing the opium traffic, afterwards passed unanimously: "That the Philippine Commission in a passage of their report, which he hoped the House of Commons would take to heart, declared that the United States so recognized the use of opium as an evil for which no financial gain could compensate, that she would not allow her citizens to encourage it even passively."

Bishop Brent, who had been a member of the Philippine Commission, closely watched the opium problem of the Far East, following the issue of the Report, and early in 1908 wrote to President Roosevelt suggesting that the time was ripe for the calling of an International Commission to study the opium problem and if possible devise measures for its solution. The matter was promptly taken up by the State Department, and all those Powers having territorial possessions in the Far East were invited by our Government to confer on the problem. The original idea was that the discussion of the opium question should be confined to those countries having territorial possessions in the Far East, and treaty relations with China. With this idea dominant, China, France, Germany, Great Britain, Japan, The Netherlands, Portugal and Russia were invited, and consented to meet the United States Government in commission. As the correspondence proceeded, the opium problem was seen to be a problem of production as well as consumption, and it was then decided to invite into the Commission the two large opium-producing countries, Persia and Turkey, two first-class European Powers who had no opium problem of their own—Austria-Hungary and Italy—and finally Siam, which being an Oriental country had an opium question on its hands. All but Turkey sent delegates to Shanghai, the internal disturbance in that country precluding it from joining the Commission. As the original idea was to confine the discussion to those nations having territorial possessions in the Far East, so also it was originally proposed to confine discussions to the opium problem as it appeared in the Far East, more particularly the problem as it affected British India and China. But, as the result of the work of the American Opium Commission in June and July of 1908, it was found that the United States had an opium problem of its own within its own continental borders. It was demonstrated that the opium-smoking habit had spread from the Chinese population to vicious black and white elements, that the importations of crude opium and the manufacture of morphine were abnormal, and that the morphine habit was widespread throughout the Union. It appeared on inquiry that a similar condition existed in some of the European States, and in those self-governing colonies of Great Britain that harbored a Chinese population—Canada and Australia, for instance—and that the morphine habit had spread to India and China. The accompanying table will show more graphically than any words the opium problem of the United States as it presented itself to the American Commission. In the last two columns of this table the population—Chinese and all others—is given since 1860, and the per cent. increase in population and in importations of smoking and crude or medicinal opium. It will be observed that in almost every ten-year period from 1860 onwards there was a larger per cent. increase in the importation of smoking and crude opium than in population, and that so far as the Chinese were concerned, though the population had remained practically stationary from 1890 onwards, there had been, nevertheless, a large per cent. increase in the importation of smoking opium. On a basis, as afterwards determined at Shanghai, it was found that the Chinese population absorbed only 142,000 pounds of an average importation of 151,000 pounds per year. The reckoning was made as follows:

OPIUM SMOKED IN THE UNITED STATES BY CHINESE.

(2 mace per diem = 73 taels per annum = 6 lbs. per annum.)

Heavy smokers: (2 mace) 6 lbs. per annum. Total number of heavy smokers 17,700 = 15 per cent.

Light smokers: (½ mace) 1½ lbs. per annum. Total number of light smokers 23,600 = 20 per cent.

Social smokers: 1 oz. per annum. Total number of social smokers 11,800 = 10 per cent.

Non-smokers: 50 per cent.

Total Chinese population, 118,000.

Average importation of opium for last eight years: per annum		151,944 lbs.
Heavy Smokers (15 per cent.). 17,700 of heavy smokers at 6 lbs. per annum	106,200 lbs.	
Light Smokers (20 per cent.). 23,600 of light smokers at 1½ lbs. per annum	35,400 lbs.	
Social Smokers (10 per cent.). 11,800 of social smokers at 1 oz. per annum	738 lbs.	
Total	142,338 lbs.	142,338 lbs.
		9,606 lbs.

That is, from 10 to 20 per cent. of our Chinese are habitual smokers, and we may accept 2 mace per day as the average amount consumed by these habitués. Taking an average of 15 per cent. of heavy smokers at two mace a day, we would have, as shown by the above table, 17,700 Chinese smoking 6 pounds of opium per annum—a total of 106,200 pounds.

Light smokers—that is, those who smoke when from illness they feel the need of it, say once a day or twice a week—would consume an average amount of about half a mace a day. Twenty per cent. of light smokers would give us 23,600 Chinese in this class. That would account for a per annum per capita consumption of 1½ pounds, or a total of 35,400 pounds of smoking opium.

It developed in the course of our inquiry that amongst the Chinese population there is another class of smoker. I have classified this third class as the "Social Smoker," and I am quite within the case if I state that they represent 10 per cent. of our total Chinese population. A liberal estimate for each individual is one ounce per annum. Chinese in this class confine their smoking to holidays and to ceremonial occasions, and smoke as a matter of courtesy only. This class represents say 10 per cent. of our Chinese population—a total of 11,800 Chinese who smoke one ounce of opium per annum, or a total of 738 pounds per annum. These smokers of different classes account for 142,338 pounds of the 152,944 pounds of our average importations for the past eight years.

This leaves 9,606 pounds of smoking opium not accounted for, and to it we must add an estimated, but large, amount surreptitiously manufactured in the United States and the larger amount known to be smuggled annually. Not to depend on the figures of our Commission in the matter of this smuggled opium, it might be well to bring in the evidence of a fellow Commissioner who represented a great daughter nation of Great Britain in the International Commission.

The Hon. MacKenzie King found in the course of his investigation of the opium question in Canada that is the coast cities of Vancouver, Victoria and New Westminster, there were at least seven factories carrying on an extensive business in the manufacture of smoking opium. He stated in his published report that it was estimated that the annual gross receipts of these combined concerns amounted for the year 1907 to between $600,000 and $650,000. Crude opium he found, was imported from India in cocoanut shells, and was then manufactured into smoking opium; that these factories were owned and these manufactures carried on by Chinese; and that it was asserted by the owners of these establishments that all of the opium manufactured is consumed in Canada by Chinese and white people; but he himself concluded that there is strong reason for believing that much of what is produced at the present time is smuggled into China and the coast cities of the United States.

As to what per cent. of the population of the United States absorb the smoking opium not used by the Chinese, it is difficult so state. It was not an uncommon occurrence in the investigations last year to have the local press announce my arrival, and then ask: "All dope fiends to report to me." Of course they reported? But from estimates from police departments; from physicians; from wardens of jails; from opium habitués themselves; from educated and intelligent Chinese; and from other reliable sources; it was estimated that there are from 3,000 to 15,000 opium smokers among the American white and negro population of three of our largest cities. I think we are perfectly safe in taking 5,000 as the average number of American whites and negroes who smoke opium in these cities. Basing the data on the law of averages, and applying it to other centers of population, it seems very certain that there are from 100,000 to 150,000 opium smokers other than Chinese in the United States.

As to high-grade gum opium imported ostensibly for medical purposes, the writer will always feel deeply indebted to the importers and manufacturers of opium preparations in this country for the frank manner in which information was given him as to the disposition of the drug. It was learned from them that from 50 to 75 per cent. of the crude opium imported is absorbed in the manufacture of morphine, and that from 50 to 75 per cent. of such morphine is used illicitly. This would mean that at least 300,000 pounds of our annual importation of crude opium is manufactured into morphine, and is consumed in our States, Territories and the District of Columbia. Over two thousand of our leading physicians and surgeons were canvassed for an opinion as to the legitimate need for opium in this country. The lowest estimate that I received was that 50,000 pounds would suffice for the licit needs of the American people; the highest 100,000 pounds. This being so, our importation of over 500,000 pounds per annum for the last ten years is appalling.

Having made these discoveries in the United States, our State Department determined to widen the scope of the Shanghai inquiry so as to include the opium problem as it exists not only in Oriental countries, but in the home territory of those nations that were to take part. This enlargement was accepted by the other Governments, and when the delegations met at Shanghai, they were nearly all able to place before the Commission as a whole the status of the opium question in their home territories as well as in their possessions in the Far East.

The Shanghai Commission was to have met on the 1st of January, of the present year, but as the delegations assembled, the death of the late Dowager Empress and Emperor of China occurred, and it was felt that out of respect to them, the meeting of the Commission should be postponed. The proposal for this postponement came from the American Government, and was accepted by all Governments taking part, February 1st being named as the date of the first meeting. I think it can be truthfully said that the International Opium Commission will go into history as one of the most business-like Commissions that ever met, and when the intricacies of the problem are borne in mind, it will be looked upon as one of the calmest and most reasonable discussions that has ever taken place. It may be claimed that this was primarily due to the conciliatory attitude of the American delegation, and to their knowledge of the economic, political and moral aspects of the problem submitted to them. The American delegation naturally took the lead—its Government having convened the Commission. Bishop Brent, Chief of the American Commission, was promptly, and without any of the intrigue that is usually associated with such elections, made President of the Commission. This was largely through the courtesy of the British and Chinese Governments in ordering their Chiefs of Delegation to support him for that office. The Chinese Government appointed as High Commissioner, the Viceroy of the Liang Provinces, His Excellency Tuan Fang, who has recently been transferred as Viceroy to the Metropolitan Province of Chihli. Their active delegation was composed of an official of the Wai Wu Pu or

Foreign Office, of another Attaché of the Wai Wu Pu, who was a distinguished graduate of Yale University, having a remarkable command of English. He is besides a Christian. Although the active delegation was not of the high official rank that it should have been, it was, nevertheless, quite capable of expounding and advocating the Chinese conception of the opium problem. The British Government had a distinguished delegation, made up of a former first-class Colonial Governor and Privy Councillor, who represented the Colonial Office; an Acting Financial Secretary of the Indian Government, who represented India; a high official from the Consular Service in China, who represented the Foreign Office; the Minister of Labor in the present Canadian Parliament, who represented Canada; and a Member of Parliament who had been actively engaged in agitating the opium problem in Great Britain. But it was a divided delegation—three of the members fully realizing the iniquities of all sides of opium abuse; while two were bent upon preserving the *status quo*. Without invidious comparisons, it may be said that each Government was well represented by an intelligent and dignified body of delegates, who were all animated by a desire to see the problem raised from the plane of sentiment to a plane of exact and thorough statement. It was freely prophesied both in this country and abroad, that the Commission would sit for at least six months, and then probably break up without arriving at any definite conclusion. So much fear was entertained—in England at any rate—that it was thought advisable by the leaders of the anti-opium movement to invoke the blessings of the National Church on the Commission. It will be realized that the Commission worked actively and efficiently when I state that thirteen sessions were held of about five hours each, and that the Commission adjourned on the 27th of February, after coming to a unanimous conclusion. As leader on the floor, it devolved upon the writer to steer the work of the Commission. The American delegation was animated by one or two fundamental ideas. I recognized that, although the United States had a large moral interest at stake, as compared with Great Britain, the Netherlands, France, and several other countries represented, the financial interests were of minor importance. They determined not to harp on the moral aspects of the question, but to take it for granted that the mere existence of the Commission was tantamount to acknowledging that the excessive production and use of opium was immoral. The American delegation also concluded before going into the Commission that it would not press for any conclusion that could not be carried by an overwhelming majority or unanimously. It was determined at all hazards to avoid a majority and minority report, which had so often thrown the opium question into the melting pot. It was found that the delegations had met the American desire and were prepared to place a comprehensive report, each on its own country, before the Commission as a whole.

By the 20th of February each delegation had submitted a report on its own opium problem that was satisfactory to the other delegations. The question then arose as to what should be the conclusion on the whole matter. The other delegations naturally looked to the American for a programme. This had been carefully thought out before the Commission met, and in consultation with several of the delegations that were strongly anti-opium, a programme was drawn up in the form of a series of resolutions. On the 23rd of February these were submitted to the consideration of the Commission as a whole.

There is no need to occupy space by presenting the original American Resolutions. They were all either accepted without alteration, their ideas were embodied in other Resolutions, or they were amended to satisfy the other delegations.

There follow the nine Resolutions that were unanimously decided upon by the Commission:

Be it Resolved

" 1. That the International Opium Commission recognizes the unswerving sincerity of

the Government of China in their efforts to eradicate the production and consumption of opium throughout the Empire; the increasing body of public opinion among their own subjects by which these efforts are being supported; and the real, though unequal, progress already made in a task which is one of the greatest magnitude.

"2. That in view of the action taken by the Government of China in suppressing the practice of opium smoking, and by other Governments to the same end, the International Opium Commission recommends that each delegation concerned move its own Government to take measures for the gradual suppression of the practice of opium smoking in its own territories and possessions, with due regard to the varying circumstances of each country concerned.

"3. That the International Opium Commission finds that the use of opium in any form otherwise than for medical purposes is held by almost every participating country to be a matter for prohibition or for careful regulation; and that each country in the administration of its system of regulation purports to be aiming, as opportunity offers, at progressively increasing stringency. In recording these conclusions the International Opium Commission recognizes the wide variations between the conditions prevailing in the different countries, but it would urge on the attention of the Governments concerned the desirability of a re-examination of their systems of regulation in the light of the experience of other countries dealing with the same problem.

"4. That the International Opium Commission finds that each government represented has strict laws which are aimed directly or indirectly to prevent the smuggling of opium, its alkaloids, derivatives and preparations into their respective territories; in the judgment of the International Opium Commission it is also the duty of all countries to adopt reasonable measures to prevent at ports of departure the shipment of opium, its alkaloids, derivatives and preparations to any country which prohibits the entry of any opium, its alkaloids, derivatives and preparations.

"5. That the International Opium Commission finds that the unrestricted manufacture, sale and distribution of morphine already constitute a grave danger, and that the morphine habit shows signs of spreading; the International Opium Commission therefore desires to urge strongly on all governments that it is highly important that drastic measures should be taken by each government in its own territories and possessions to control the manufacture, sale and distribution of this drug, and also of such other derivatives of opium as may appear on scientific inquiry to be liable to similar abuse and productive of like ill effects.

"6. That as the International Opium Commission is not constituted in such a manner as to permit the investigation from a scientific point of view of anti-opium remedies and of the properties and effects of opium and its products, but deems such investigation to be of the highest importance, the International Opium Commission desires that each delegation shall recommend this branch of the subject to its own government for such action as that government may think necessary.

"7. That the International Opium Commission strongly urges all governments possessing concessions or settlements in China which have not yet taken effective action toward the closing of opium divans in the said concessions and settlements to take steps to that end, as soon as they may deem it possible, on the lines already adopted by several governments.

"8. That the International Opium Commission recommends strongly that each delegation move its government to enter into negotiations with the Chinese government with a view to effective and prompt measures being taken in the various foreign concessions and settlements in China for the prohibition of the trade and manufacture of such anti-opium remedies as contain opium or its derivatives.

"9. That the International Opium Commission recommends that each delegation move its government to apply its pharmacy laws to its subjects in the consular districts, concessions and settlements in China."

Resolution 1 is a courtesy resolution to China.

Resolution 2 recognizes the evil of opium smoking, and calls upon each government to gradually suppress the practice in its own territories and possessions.

Resolution 3 recognizes that opium should be held for medical use only, and was aimed at those countries where medical practice is loose, such as India and China. It is hoped that as a result of the investigations made in the commission, and the exposure of some of the weaknesses, that the Indian system of excise, under which opium is sold to the native population, will be made more strict.

Resolution 4 was in many ways the most important one adopted, and it required considerable skill to get the British delegation to accept it. It declares for a new principle in international law, in that it throws the main burden of preventing the illicit traffic in the drug on the producing country, and does not leave it wholly on the shoulders of the prohibiting country. It was urged on the delegations that in our National Pure Food Law we had established the principle that the shipper of adulterated or misbranded foods or drugs abroad should bear the same penalties as the shipper in our interstate commerce; that the American government had embodied this principle in one of its national laws voluntarily, and that the time had arrived for the principle to be recognized in international law. Canada, Australia, New Zealand, as well as ourselves on the Pacific coast and in the Philippines, are, as the result of prohibitory legislation now in effect, confronted by large smuggling operations. To make the Philippine prohibitory law effective, would mean an addition of over a million and a half dollars to the annual budget. This, together with a loss of three per cent. of its revenue, as stated above, would be too large a burden for the Philippine government to bear. If the principle embodied in resolution 4 is conventionalized, it will become the duty of countries like India, Persia and Turkey, and centers for the manufacture of smoking opium like Macao, Hong Kong and the Straits Settlements, to prevent the departure of opium to all countries and states that have prohibited its entry.

Resolution 5 frankly recognizes an abuse that for the last ten years has rapidly spread not only in Europe and America, but in India and China, and it is not too much to say that drastic measures should be taken by each government to control the manufacture, use and distribution of this drug.

Resolution 6 was the one disappointing conclusion of the Commission. No commission will ever be quite perfect. The American delegation strongly urged a sub-committee for the study of the scientific and medical aspect of the uses of opium. There were several scientists in the Commission who were quite competent to make such a report; but for some reason, which did not clearly appear, the British delegation opposed the American resolution and it was lost. The scientific question was reverted to the various governments.

Resolution 7 was necessary because, although the different European governments having concessions and settlements on the China coast had voluntarily closed most of them before the Commission met, there were several dens still open in the French settlement at Shanghai. It was felt that a resolution of this sort would compel the closing of all dens in the foreign settlements and concessions. It was introduced by the Chinese and met with hearty support.

Resolution 8 was aimed at an abuse that has appeared in China since the anti-opium agitation and since the measures against the use of opium were taken a couple of years ago. To be known as an opium smoker amongst the respectable classes in China is to "lose face"—a most unhappy state for a Chinaman. But many of the gentry and others—even peasantry—although they have abandoned the pipe, have found in these anti-opium remedies a solace for their sacrifice, for they soon learn by practical experience that they contain large amounts of morphine and opium, which satisfy their craving for the pipe. European and American chemists, especially in the settlements, have taken

advantage of this and literally flooded China with these anti-opium pills and other cures—all proved by analysis to contain varying quantities of opium and morphine. The cure threatened to become worse than the disease. The Chinese delegation introduced Resolution 8, and it met with the full sympathy of the Commission.

Resolution 9 was an American resolution. If carried out it will place our subjects and the subjects of other governments, and all manufacturing pharmacists and dispensing chemists under the pharmacy laws of the nations concerned. In the case of our own government, the pharmacy law of the District of Columbia would be made to apply.

Now, it should be distinctly understood that in pressing for certain distinct conclusions at Shanghai, the American delegation had to keep in mind that the commission was only a commission of inquiry, and that the final work in controlling opium production, traffic and use would have to be by a conference having full diplomatic powers. Such a conference is now under consideration; and when it meets these Shanghai declarations will be conventionalized and extended, and the whole production, traffic and use of opium controlled by international agreement.

Reverting to the position of the United States you will all remember that an anti-opium bill went into effect on the first of last April. This bill was drawn up to prevent more particularly the importation of smoking opium into this country. It has been effective as is proved by the fact that the Macao factory, from which most of our smoking opium was imported, has become bankrupt. To place the American opium problem on a satisfactory basis, federal legislation will be necessary, and, to this end, members of the Association are being consulted as to just what form such a bill should take. It would seem that the most satisfactory results can be achieved by placing the manufacture and distribution not only of opium, but cocaine, under the Bureau of Internal Revenue. A stamp tax will be imposed sufficient to cover the administration of the law. It is probable that original manufacturers and manufacturing pharmacists will be required to pay a small fee for a license. It should be clearly recognized by the members of the Association that it is the bounden duty of tbe United States to appear at any future conference with its own opium problem under control, and I am certain that any legislation that is enacted will meet with the approval of the Association.

HAMILTON WRIGHT,
U. S. Delegate to International Opium Commission.

The Chairman stated that he was sure the members were under very great obligations to Mr. Cook for his kindness in reading this long paper. His excuse for having it presented at such length was the high official character of the paper, and the very valuable matter contained in it. He said that attached to the paper was a copy of a proposed law to regulate the opium traffic, but he feared it would be asking too much of Mr. Cook to read this also. Mr. Cook very kindly consented to do this, however, and the paper here appears:

DRAFT OF PROPOSED LAW TO REGULATE THE TRAFFIC IN OPIUM AND SIMILAR DRUGS.

Sec. 1. That an internal revenue tax of one cent an ounce shall be levied and collected upon all opium, cocaine, alpha and beta eucaine, chloral hydrate, *cannabis sativa*, their derivatives and preparations manufactured in the United States; and no person shall engage in such manufacture who has not given the bond required by the Commissioner of Internal Revenue.

Sec. 2. That every manufacturer of such opium, cocaine, alpha or beta eucaine, chloral hydrate, *cannabis sativa*, their derivatives and preparations, shall file with the collector of internal revenue of the district in which his manufactory is located such notices, in-

ventories, and bonds, shall keep such books and render such returns of material and products, shall put up such signs and affix such number to his factory, and conduct his business under such surveillance of officers and agents as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may, by regulation, require. But the bond required of such manufacturer shall be with sureties satisfactory to the collector of internal revenue and in a penal sum of not less than five thousand dollars; and the sum of said bond may be increased from time to time and additional sureties required at the discretion of the collector or under instructions of the Commissioner of Internal Revenue.

Sec. 3. That all opium, cocaine, alpha or beta eucaine, chloral hydrate, *cannabis sativa*, their preparations and derivatives imported into the United States shall, before removal from the custom-house, be duly stamped in such manner as to denote that the duty thereon has been paid; and that all opium, cocaine, alpha and beta eucaine, chloral hydrate, *cannabis sativa*, their derivatives and preparations manufactured in the United States or elsewhere, before being removed from the place of manufacture or customs warehouse, whether for consumption, compounding or storage shall be duly stamped in such permanent manner as to denote the payment of the internal revenue tax thereon. And every officer of customs or internal revenue who permits any such articles to pass out of his custody or control without compliance by the owner or importer therof with the provisions of this section relating thereto, shall be deemed guilty of a misdemeanor, and shall be liable to the penalties imposed herein.

Sec. 4. That every manufacturing chemist or manufacturing pharmacist who compounds, deals in or distributes any opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, in the United States shall affix an internal revenue stamp to each package or other receptacle which contains any opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, which shall certify that the opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, contained in such package or receptacle has paid the tax hereinbefore imposed on the manufacture of opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, and no manufacturing chemist or pharmacist shall engage in the compounding, sale or distribution of opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, who has not given the bond required by the Commissioner of Internal Revenue.

Sec. 5. That every manufacturing chemist or pharmacist who manufactures, compounds, deals in or distributes opium, cocaine, alpha and beta eucaine, chloral hydrate, and *cannabis sativa*, their derivatives and preparations, shall file with the collector of internal revenue of the district in which his manufactory or place of business is located such notices, inventories and bonds, shall keep such books and render such returns of material and products, shall put up such signs and affix such number to his factory or place of business and conduct his business under such surveillance of officers and agents as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulation require; but the bond required of such manufacturing chemist or pharmacist shall be with sureties satisfactory to the collector of internal revenue and in a penal sum of not less than five thousand dollars, and the sum of such bond may be increased from time to time and additional sureties required at the discretion of the collector or under instructions of the Commissioner of Internal Revenue.

Sec. 6. That all persons, other than the original manufacturer of such opium, cocaine, alpha and beta eucaine, chloral hydrate, *cannabis sativa*, and their derivatives and preparations, who further manufacture, compound, distribute, or deal in the drugs hereinbefore mentioned, shall, before engaging in the manufacture, compounding, distribution, or dealing in the same, obtain from the Collector of Internal Revenue of the district

wherein their place of business is situated a license, the charge for which shall be at the rate of $10.00 per annum for a manufacturing chemist or pharmacist, wholesale dealer or jobber, and the sum of $2.00 per annum for a retailing or compounding pharmacist or chemist; and, *provided further*, that such retailing or compounding pharmacist or chemist shall not sell any preparation of any of the drugs hereinbefore mentioned to any person other than a person engaged in the same business as his own and who holds a license, to a registered physician, or upon the prescription of such registered physician; and, *provided further*, that the possession by any person of any of the drugs hereinbefore mentioned, or their derivatives and preparations, except as hereinbefore provided, shall be conclusive evidence of illegal possession, and shall subject the holder to the penalties provided herein.

Sec. 7. That the provision of existing laws governing the engraving, issue, sale, accountability, effacement, cancellation, and destruction of stamps relating to tobacco and snuff, as far as applicable, are hereby made to apply to stamps provided for by the preceding sections.

Sec. 8. That a penalty of not more than one thousand dollars, or imprisonment not more than one year, or both, in the discretion of the court, shall be imposed for each and every violation of the preceding sections of this act relating to opium, cocaine, alpha and beta eucaine, chloral hydrate, *cannabis sativa*, their derivatives and preparations, by any person or persons; and all opium, cocaine, alpha and beta eucaine, chloral hydrate, *cannabis sativa*, their derivatives and preparations, wherever found within the United States without stamps required by this act shall be forfeited, and may be sold to the highest bidder, pursuant to the provisions of section thirty-four hundred and sixty, Revised Statutes, if not valued as therein provided, at over five hundred dollars; but if valued at more than five hundred dollars, the sale shall be made pursuant to the judgment of the court in the proceedings for condemnation or forfeiture.

The Chair called attention to the fact that Dr. Wright had asked in his letter just read for suggestions from the members of this Association, and particularly on the subject of the proposed law, and that before leaving Philadelphia he had submitted Dr. Wright's paper, together with the proposed law, to a prominent member of this Association, Mr. M. N. Kline, who had written him a letter on this subject that he desired to read:

PHILADELPHIA, *July 23, 1909.*

MR. J. W. ENGLAND, *Philadelphia.*

My dear Mr. England: I thank you for letting me look over the paper sent to you by Dr. Hamilton Wright, a member of the Commission of the United States to the International Opium Commission at Shanghai, to be presented at the meeting of the A. Ph. A. at Los Angeles next month.

The paper is of great interest, and the facts therein set forth of the utmost importance, and the statement contained therein that we import into the United States annually 500,000 pounds of opium, while a liberal estimate of the amount needed for legitimate purposes would be 100,000 pounds, is certainly startling if the latter estimate is correct.

The work of this Commission is not only to be commended, but should receive the active and hearty co-operation of all those who are in favor of restricting the indiscriminate sale of habit-forming drugs.

I was also, of course, interested in the draft of a bill suggested by Dr. Wright, but I feel that that needs amendment in a number of particulars before it can receive the endorsement of the A. Ph. A.

First of all, I question whether we are prepared to apply this sort of legislation to

articles other than opium and its preparations, and cocaine, and, furthermore, I do not believe that quite the same rules should be applied to opium and its preparations as should be applied to cocaine and its preparations. The latter, while a most important remedy in a very limited field, should be used only under the direct supervision and control of a physician, dentist or veterinarian. The former, when used in small doses, has such a wide field that very different rules should apply to opium and its preparations than can or should be applied to cocaine.

My suggestion is that this sort of legislation should receive the careful consideration of some carefully selected committeee from the A. Ph. A., who could make suggestions to the members of the commission that undoubtedly would have value.

Some of the features of this suggested legislation are, to my mind, very objectionable. The legislation is proposed in the interest of the community at large and not in the interest of those manufacturing or dealing in the preparations under consideration. Why, therefore, should the latter be taxed for the purpose of defraying the expenses incident to enforcing such a law?

That the Revenue Department could probably be very valuable in connection with keeping records of the manufacture and sale of these preparations is unquestioned, but the expenses of the Revenue Department should be borne by the people at large, and not by the people manufacturing and handling the articles alone, as they are no more interested than the consumer.

Then, if the use of opium and its preparations is to be confined to physicians' prescriptions a clause should be inserted in the bill prescribing severe punishments for physicians who prescribe for illegitimate uses. We must not overlook the fact that perhaps a larger proportion of "dope fiends" are found amongst physicians than any other class of our people, and that there are at least some who would be willing to prescribe, for a small consideration, without exercising much care as to its proper use.

The registration of sales and the attaching of a revenue stamp is a valuable suggestion, but I have not sufficiently examined the suggested bill to express an opinion upon it as a whole further than that given above, and therefore urge the appointment of a carefully selected committee of pharmacists, in whose hands shall be committed the subject for careful consideration before the suggestion is endorsed in the form prescribed by the A. Ph. A. Yours very truly, M. N. KLINE.

The Chair called for remarks upon Dr. Wright's paper, or upon the communication of Mr. Kline.

Mr. J. U. Lloyd, of Cincinnati, started the discussion. He stated that it was his pleasure and duty a few years ago to go to the opium country of Turkey, to study opium in its home, and he wished to call the attention of the members to the fact that had we in this country such an unwritten law as controls the Turks in this behalf there would be no reason for a statute on the subject. Turkey, he said, produces the largest amount of opium, and the best opium, in the world—the so-called civilized world. But not one evidence did he find anywhere in Turkey, either in the provinces where the opium is raised, or in the cities where it is collected together, of any Turk using opium in any way whatever, either as a medicine or as a habit. He was astonished at this condition of affairs. He made particular effort, after being struck with this thought, to find out if he could be mistaken, and he found no evidence anywhere to sustain the belief that any Moslem—any Turk—utilized this drug in any way. He

recalled how he stood in one of the great opium warehouses of that country, and watched the process of inspection of this drug as it came in. On the floor before him sat, cross-legged, the official inspector. The boxes and bales of opium were brought in by the dealers and the balls of opium dumped at his feet. Each ball was taken by the inspector, and then with a sharp knife, he would cut into it and take out a slice. Upon merely glancing at it, the ball would be thrown to one side or the other. Simply by looking at it he standardized it! It was the expertness of experience. Mr. Lloyd said he could not comprehend how this inspector could have the knowledge and power to say, "This opium must be excluded from the market: this may enter it." He personally picked up a ball of the excluded opium, but could find nothing the matter with it. He asked what the trouble was, and was met with the exclamation, "Prunes! Prunes! Prunes?" He touched his finger to it, and touched it to his tongue; and instantly these men jumped up and grasped him by the hand and said, "You must not taste it!" He asked the chemist whose business it was to make an assay of opium for the European and American market what this man could know about the opium that he was throwing on the one side or the other, and replied, "Seldom does he make a mistake. That opium that he excludes will run down to six or even four per cent., invariably." In conclusion, Mr. Lloyd reiterated the statement that if we in this great civilized land of America could have such regard for an unwritten law as these people, whom some are accustomed to regard as without the pale of civilization, there would be no necessity for a statute law such as that proposed.

Mr. Diggs, of Los Angeles, asked if, in such an important matter as this, and one in which the pharmacists sympathized so thoroughly, that of the control and use of opium and similar preparations, the Association ought not to take some action upon this subject.

The Chair said that Mr. Kline had suggested the appointment of a committee to consider this paper, and report later, and asked Mr. Diggs if he would make such a motion. The gentleman thereupon moved that a committee of five be appointed to consider the paper and report later on, and this motion was seconded by Mr. Hemm, and carried.

The Chair stated that the Convention was fortunate in having with it this morning Mr. Lyman F. Kebler, from whom the Association would be glad to hear upon the subject of the Regulation of the Opium Traffic.

Mr. Kebler began by stating that at the time he wrote the title to the paper to the Chairman of this Section it was his intention to present a formal paper, but owing to an emergency which had arisen it had been found impracticable to present it. He said, however, that he would give a few of the salient points on the subject that he had in mind, in the form of oral remarks.

Mr. Kebler said that during the past few years he had been particularly

interested in the study of the drugs conducing to habit-formation, and particularly morphine, opium, cocaine, and products of that type. He said that at present the Government had a line on not less than thirty-five dealers who are sending drugs of this type broadcast over the United States—opium, preparations of morphine, cocaine, etc.—under the guise of "cures." Most of these are not intended as a cure at all, but are highly saturated with morphine or opium, and a few contain cocaine. He said that last year, on returning from the meeting of the American Pharmaceutical Association at Hot Springs, Arkansas, he had gone to Atlanta, Ga., and there he visited one of these institutions of alleged cure for the morphine habit—an institution that gave both local treatment to drug addicts and did a mail-order business. The man who had charge of the business was very courteous to him, and when the speaker told him he had come to look into his business, he opened up his books and showed him the situation. The firm had been in existence for a good number of years, and when Mr. Kebler inquired as to the number of drug habitues they were treating by correspondence, he answered that he had on his books approximately one hundred thousand names. "Think of it!" said Mr. Kebler, "of one institution of this sort in the South with the names of one hundred thousand drug habitues on its books!" Mr. Kebler stated, however, that it had been his experience that a large number of such names as these were duplicates. For example, this firm in Atlanta may have the names of a hundred thousand of these people; but another firm in Texas, or Chicago, or New York, or Cincinnati will have some, and probably all, of these same names. This man, he said, kindly invited him to go out to the institution where they were treating drug addicts who presented themselves personally. There he met several physicians. This reminded him that the point made by Mr. Kline in his letter relative to physicians being the greatest sinners in the matter of drug-addiction and habit-formation had been brought out in many ways from the information he had gathered at Washington, including specific information coming from the doctors themselves. During his visit there he had a talk with one of these doctors under treatment, and the man in charge told him that was Dr. So-and-So; that he had been in the institution before and had been "cured"; that just previous to his coming to the institution the last time he had reported that he was taking 25 grains of morphine and 10 grains of cocaine daily. Mr. Kebler said he talked with this doctor-patient for quite a little while, and he made no "bones" about it whatever. He told him plainly that that was what he took, and he also ventured the information that the week before he came to that institution he had performed a number of major operations, such as removal of the uterus of a number of women, amputation of limbs, etc. "What are we coming to," said Dr. Kebler, "when we have men of that character carving up our people—performing abdominal sections and things of that sort? A man who will take 25

grains of morphine, and in addition to that 10 grains of cocaine! What can be expected?"

Mr. Kebler said the department had examined now approximately all of the products that had been shipped in interstate commerce by these people representing themselves as being able to cure drug addiction. He said that one package which had come to the Department from the State of Texas contained not less than 32 grains of morphine to the ounce, while a 4-ounce bottle contained a little over 120 grains—enough to put a number of people out of commission. "The serious feature is this," said Mr. Kebler: "that in these cases there was not enough menstruum to dissolve the morphine, and a large amount of the morphine sulphate will be found as a precipitate at the bottom, and it is no wonder that a large number of these morphine addicts sooner or later come to their end by indiscretion—not so much by carelessness, either, but because of the fact that the product is put up in that manner." Mr. Kebler said he referred to Texas particularly, because they have a good law in the State of Texas to control this situation of morphine and cocaine. Exactly how aggressive the officials were in that State in enforcing the law he was not prepared to say. There was also another State where they had such a law, and aggressive action upon this subject. The State of Virginia, he said, had been very active, and had done a great deal to suppress the cocaine evil. He said he could relate a number of very interesting stories that had come to him through the officials of the State, but he had not the time. They had been ever willing to co-operate with the United States Government, and if it was found that any individual from the State of Virginia was sending cocaine, or a product restricted or prohibited in sale in another jurisdiction, into the District of Columbia, they would be willing to take up the case under their own law as a State proposition. This was an admirable object-lesson to those in other States entrusted with the enforcement of laws of that type. The State of New York was another that was preparing to handle the proposition. The whole question was in its infancy as yet, and he thought it might be possible to handle the situation in this way only, without any further legislation. This was all experimental, however. "But those of you who are acquainted with State procedures and some of the judges you are compelled to take these cases before, full well realize the dangerous ground upon which you are treading. For example, it is well known that many judges are more or less controlled by politics, and they will look with ease and leniency upon the violator of the law." He had in mind an adjacent State to the District of Columbia (Maryland), where similar conditions obtain. That trouble is not found in the federal courts, for as a rule the federal judges construe the laws in favor of the public—in favor of the public health, irrespective of who may be back of it.

Continuing, Mr. Kebler said that these people who sell these goods in-

discriminately from one State to another, and largely within the State in many instances, where the Federal law cannot touch them, are of the most irresponsible type. They have no knowledge, whatever, in a great many instances, of the medicine they dispense.

"What is the remedy?" said Mr. Kebler. He did not believe that the situation could be entirely relieved by any one form of legislation, but that it would require the co-operation of the state and federal governments both, in every detail, to ferret out this iniquitous practice. He said that the doctors were amongst the worst sinners, and also the worst people to get at, because they seem to hedge themselves about with special privileges of personal prerogative, which make them very difficult to reach by ordinary means. A proper federal law would do a great deal to remedy the situation, in conjunction with the state laws. He eulogized the Mann Bill, which had been severely criticised, especially from the doctors' point of view. A few druggists had also opposed it, but in the main he thought the bill contained the nucleus of an excellent federal law to control the situation.

The Chair stated that closely connected with this subject was the subject of temperance, and at last year's meeting at Hot Springs, in the Section on Education and Legislation, there was appointed a committee on the temperance movement in its relation to the retail druggist, to consider and report at this time. He said he would therefore call on Mr. H. B. Mason, chairman of that committee, to report for the committee. Mr. Mason made his report as follows:

REPORT OF SPECIAL COMMITTEE ON THE TEMPERANCE MOVEMENT.

THE LIQUOR SITUATION IN PHARMACY DURING THE LAST YEAR.

The special committee appointed by this Section a year ago at Hot Springs, to report upon the advance of the temperance movement and to suggest ways and means of averting the crisis with which this movement has incidentally caused the pharmacists of the country to be confronted, may express its opinion in this first report that the liquor question now presents the most important problem for settlement by the drug trade of America. The rapid spread of prohibition and local-option sentiment is closing up thousands of saloons and is thus bringing a terrific pressure to bear upon an almost equal number of pharmacists. Something heroic and systematic must be done if great and lasting harm to the welfare and dignity of pharmacy is to be avoided.

The tide of temperance reform has swept onward during the last year. It has receded here and there, but for the most part it has advanced steadily. The Chairman of the Committee, in the paper read at Hot Springs entitled "Pharmacy Facing a Crisis," reported that there were then eight prohibition States. Since that time North Dakota, Arkansas and Tennessee have either adopted or have voted to adopt statewide prohibition. In the meantime scores of counties in other States have gone "dry" under local option laws.

In the elections during the last year the Anti-Saloon League has made notable gains in New York, Illinois, Ohio, Indiana and Michigan. At the present time the majority of counties are "dry" in Missouri, Texas, Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Kentucky, Louisiana, Nebraska, New Hampshire, Ohio, Oregon, South

Carolina, Virginia and West Virginia. In Colorado the saloon has been voted out of 93 towns within the last two years. In Massachusetts the temperance people have made a gain of 110 towns during the last five years, and Worcester is said to be the largest "dry" city in the world.

Everywhere the forces are lined up. The Anti-Saloon League has vigorous branches in every state; it is strongly organized and brilliantly managed; and it is planning to wrest additional victories during the next few years. Every movement of this kind ebbs and flows. Public sentiment fluctuates. Doubtless some of the counties which have become "dry" will revert to a state of moisture, but that the temperance movement has not yet reached its culmination, and that the pendulum is not ready to swing backward, are truths apparent to every careful student of the situation. Mr. Mason reported last year that nearly one-half the population of the United States, occupying two-thirds of the geographical area of the country, were then living in "dry" territory. This statement, with some amplification, will therefore fit the situation at the present time and will indicate most eloquently the prevalence and intensity of the problem which confronts us.

During the past year the reputation of pharmacy has been dragged in the mire to a degree which sickens the heart of every earnest lover of the profession. Druggists have been prosecuted in almost every "dry" section of the country for selling liquor illegally. One so-called druggist in Oregon, found guilty on two indictments, was subjected to a fine of $6,200.00 and imprisonment for one year. Others in various states have been let off with fines of $500.00 and costs, although warned in many instances by the judges that if they ever came into court again they would be sent to the state prison. In Ohio the judges have been particularly indignant, and one of them who has had occasion to preside in a number of cases has declared more than once that he would visit the whole force of the law upon every druggist and pseudo-druggist whom he found to be violating the law by selling liquor for other than strictly medicinal purposes.

The newspapers, quick to seize upon such a situation, have made the most of it. Your committee has seen dozens of cartoons during the past year facetiously informing the public that there is no occasion for despair, and that even if the saloon has been closed the drug store is still open! In many "dry" sections, too, the newspapers have made a practice of systematically reporting on the liquor sales made every week by saloon druggists in the town or locality. Thus, in a Michigan county it was recently reported that one druggist had made 500 sales of liquor during a given week, and that three or four others had followed along pretty closely in the rear with 239, 213, 194 and 190 sales respectively. It was said of one alleged druggist that, "whereas his sales last week numbered but 450, he has awakened from his torpor and increased the number this week to 520!"

Facts and figures of this kind could be multiplied by your committee if there were any good reason for recounting them. Enough has been touched upon to indicate the conditions, and to go further into detail would merely be for the purpose of building up a cumulative effect upon this audience.

It is very important, however, that we qualify the foregoing record somewhat by saying that many of the convicted druggists during the year have in fact not been druggists at all, but instead have been ex-saloonkeepers. This is one of the facts in the problem which renders it much more difficult of treatment. The saloon men, thrown out of business, have not been slow to seek protection in the drug trade. It was reported some months ago, for instance, that an Ohio saloonkeeper already had his son in a school of pharmacy, preparing him for the emergency which he expected to arise later on! In Brown county, in Ohio, which it is thought will become "dry" very soon, it is said that over 50 per cent. of the saloonkeepers are looking for registered drug clerks and making preparations to "fix up a drug store front and a whisky rear," when the lightning finally

strikes! We understand that it was largely the activities of ex-saloonkeepers, doing business under the guise of druggists, which brought the whole profession of pharmacy into such disrepute in Kansas, and finally led the Kansas legislature last winter to enact the drastic law entirely prohibiting the sale of liquor in drug stores for any purpose whatsoever.

Now what have the druggists of the country done during the last year to grapple with this threatening situation in pharmacy?

We cannot say that they have yet become thoroughly awake to the real danger. It has so far not been forced home to them with sufficient intensity. Nevertheless the problem has been discussed during the present summer at nearly all of the State Pharmaceutical meetings; during the last winter bills of one kind and another were introduced into the various State legislatures; and slowly the realization is growing that the serpent must be scotched with determination. Following the action of this Association last year in passing strong resolutions, the N. A. R. D., meeting in Atlantic City the week after, expressed itself in similar vein, and later on, at the midwinter meeting of the Executive Committee of the N. A. R. D. in Chicago, Judge Errant was requested to draw up a model liquor law or amendment to be introduced at the behest of pharmacists in the various State legislatures. Your committee feels, indeed, that the N. A. R. D. might well make the liquor question one of its vital issues, and that it could do no better and more permanent work for the present salvation and the future welfare of pharmacy and pharmacists than to make the most energetic use of its superb machinery and equipment in saving the profession from this great danger.

The liquor question as it affected pharmacy was under consideration last winter by many of the State legislatures. Some of the bills were brought forward by druggists themselves in an effort to protect the fair name of the calling; others, and in this class was a majority of these measures, were introduced by interests alien to the drug trade. A law was enacted in Michigan restricting the sale of liquor by druggists in "dry" counties to physicians' prescriptions, and another measure was nearly passed which would have imposed a similar restriction throughout the entire State. In Colorado, where a law was enacted a year or two ago allowing sales on prescriptions only in "dry" counties, the druggists are endeavoring to have the statute so amended as to remove this limitation. In West Virginia, on the other hand, where the druggists have wisely decided to take the initiative in imposing restrictions upon themselves, a new pharmacy law has been obtained which incidentally provides that the sale of liquor throughout the entire State shall be limited strictly to prescriptions, and that no druggist who is also a physician shall be permitted to fill his own orders. In the Iowa legislature there was a radical measure last winter which had the vigorous support of a number of prominent druggists, and which would have prohibited the sale of liquors in drug stores entirely, even upon physicians' prescriptions. This bill failed of passage, as did another measure which was somewhat less drastic in character. Measures of one kind or another were likewise introduced into various other legislatures, but it would load up this report with too much detail to discuss them all separately.

We have been very much gratified to find during the last year that individual druggists here and there have realized the danger to their reputation and have determined that so far as they were personally concerned they would convince the public of their honor and integrity. Such men—and there have been a good many of them here and there throughout the country—have discontinued the sale of liquor entirely as soon as their county or State adopted prohibition. They foresaw that in any event they would be under suspicion; that the disgrace brought upon the entire calling by the conscienceless minority would extend to them; and that they could not afford to undergo the risk by selling liquor even in complete and honorable conformity with the law. So they have thrown it out entirely and have so announced to the public in the newspapers and by the publication of private circulars.

In other instances the druggists of a given town or county have wisely and courageously gotten together and outlined a vigorous policy. They have said in effect: "We will protect the name of pharmacy in this locality from disgrace. We will observe the liquor law ourselves. We will see to it that others observe it. We shall permit no saloon druggist in this town to bring the rest of us into disrepute. We shall have no compunction in the matter—as soon as a druggist is found to be disobeying the law we shall throw him out of our association, report him to the local authorities, and assist in his prosecution and conviction." In our judgment this is the most effective means which can possibly be devised for handling the problem.

It is in inspiring the local associations throughout the country to take a united stand of this kind that the A. Ph. A. and the N. A. R. D. can do much valiant service. The pharmacists of every locality have it in their own hands to correct the situation if they will but exercise their power. During the last year your committee has read circular announcements made by a number of local associations here and there, notifying the public what the liquor laws are, declaring that they meant to live up to them absolutely, and asking the support of the people in order that the temperance sentiment of the community might not be violated. By prompt, honorable and courageous steps of this kind, the fair name of the pharmacists of a section may be protected and the public esteem preserved.

Many things of one kind and another have been done locally to avert the crisis during the last year. In Michigan the State Board of Pharmacy and the Anti-Saloon League have co-operated in an effort to have the present liquor law so enforced that there would be no need of more radical legislation. In New Jersey the druggists have been in consultation with the State Excise Commission and with members of the State Legislature, and so far they have succeeded in heading off drastic legislation which would have done severe harm to the reputation of pharmacy. In Chicago the retailers were so determined to save the good name of their calling that they considered the advisability of asking the Legislature to so amend the state pharmacy law as to authorize the Board of Pharmacy to revoke the license of any registered pharmacist or assistant pharmacist employed in a drug store where a regular saloon license is held. In Massachusetts, at the annual meeting of the State Association held not long ago, President Leonard made an eloquent plea for vigorous action to avert the liquor crisis, and as a result of his suggestion it was voted to have the Legislative Committee conduct a thorough investigation of conditions throughout the State during the next year and make definite recommendations at the next annual meeting. Various other state associations, indeed, have taken action of one sort or another during the last few months. In Missouri it was suggested that a committee be appointed to report violations of the liquor law by druggists throughout the State.

Just what will happen if the druggists of the country do not take this matter into their own hands has been indicated by the enactment of the new Kansas law, previously referred to in this report. Kansas became a prohibition state many years ago, but druggists were still permitted to sell liquor under certain restrictions. The restrictions were unwisely left so loose that "blind tigers" sprang up all over the State, most of them conducted by ex-saloonkeepers who sought cover under the protecting cloak of pharmacy. A year or two ago, when public sentiment demanded a vigorous enforcement of the prohibition law, it was found that so-called drug stores were practically doing business without let or hindrance and that the prohibition law was a farce. Hence the action of the last Legislature in passing a law absolutely forbidding the sale of liquor in drug stores under any conditions whatsoever, even on physicians' prescriptions.

The enactment of such a law itself may, perhaps, not be bitterly resented by us. It will possibly prove to be a good thing for pharmacy itself. But the bitter and nauseous taste of the pill is due to the fact that it is crammed down our throats instead of being

self-administered—that the enactment of the law is tantamount to saying that the State can no longer trust druggists, that they have proved weak and erring, that they have abused their privileges, and that the only thing to do is to tie their hands completely. That Kansas history will be repeated in other states unless pharmacists do something to prevent it cannot be doubted. It is the handwriting on the wall.

Your committee may conclude its report by expressing its conviction that the drug trade of the country in facing a real crisis. We must realize this thoroughly. We must undertake systematic and vigorous measures of one kind and another, local, State and national, to save our reputation. We must not wait for alien interests to surround us with restrictions. We must impose these restrictions ourselves. We must convince the public, the newspapers, the legislatures, and the prosecuting authorities, that we are honest in the matter, that we have no desire to extract profit from the present temperance movement, and that we are more anxious than anybody else to seek out and punish those within our ranks who bring us all into disgrace.

HARRY B. MASON, *Chairman*,
L. E. SAYRE,
GEORGE F. PAYNE,
PHILIP ASHER,
F. W. MEISSNER.

The Chair called for action on the report just read, and Mr. Ladish moved to accept and refer to the Publication Committee, which motion was seconded by Mr. Diggs and carried.

The Chair asked if it was the wish of the Section to continue this special committee, and Mr. Diggs moved that the committee be continued. The motion was seconded by Mr. Ladish.

Mr. Hallberg, discussing the paper, asked the writer if he had good authority for the figures which appeared, to the effect that in a certain drug store they had made 500 sales one week, and the next week did considerably better than that, and so on. He said he would like to know whether these figures were taken from an authentic source.

Mr. Mason replied that it so happened that these figures to which Mr. Hallberg referred were figures of sales in Michigan, where the law requires that a record of all sales must be kept, such record being open to official inspection. After saying so much, he thought he ought also to say that he did not personally get these facts from that record, but the facts were obtained from a local newspaper, taken from the record; and he thought that, although the newspapers were sometimes willing to distort facts, these figures could be scarcely otherwise than correct, as they were taken from official statistics.

Mr. Hallberg said he had in mind a statement attributed to Mr. Mason last year at the Hot Springs meeting, where the newspapers had said that he had made certain statements to the effect that there was not one druggist in ten thousand that did not sell liquor or alcohol, and that Mr. Mason had informed him and others that he had not made any such statement—that the newspapers had gotten it wrong, and made a sensational article. Mr. Mason confirmed this statement, and said that he had

said nothing of the kind, but that the majority of druggists were square in this matter, and he had repeated in several different phases of the question that it was a small minority that were bringing the rest of them into disrepute. A newspaper man had come to him, and he had stated the facts to him, but he had nevertheless gone off and grossly misstated what he had said, greatly to his embarrasment.

Mr. Hallberg thought great care should be shown in statements made by pharmacists on this subject, because there were certain influences constantly watching to find something that would act in an unfavorable way on the retail druggists. "This liquor problem has been with us many years," he said, "and it will never die, for the reason that these distilled liquors are the most extensively used medicines, and the most valuable therapeutic agents; and thus it is necessary that the druggist should sell them: and under proper conditions he ought to be allowed to sell distilled spirits to the people who want to use them as medicines, just as he would have the right to sell medicines of that class not exceedingly potent. The whole trouble lies in the perverted state of the public mind as to the use and abuse of alcoholic liquors. It is only in this and the English-speaking countries generally where this question comes up, and it is primarily due to the fact that we do not differentiate between distilled spirits and natural alcoholic liquors. Such a thing as any permanent prohibition is absolutely impossible, because it is a problem of the economy of life. All people, civilized and uncivilized, use alcoholic liquors. From the time of Noah, when he assembled the animals in the ark and got busy, down to the present time, all people have used alcoholic beverages. They cannot do without them. It costs too much to feed the body without them. The poor Bavarian peasantry, the most economically inclined people in all this world, the French peasant, and from them all the way down, find it necessary to use alcoholic beverages in the form of wine and beer, in order that the food which they eat shall be of more value to them, and because they sustain life at less cost than without alcohol. That is true practically of this whole question of the use of alcohol. It is an economic question. But unfortunately for us pharmacists, we are placed between these two stones of opposing forces, the people that are absolutely opposed to alcohol in any form, and the people that like to use it as a medicine. And many people, where they cannot get it from the regular sources, will appeal to the druggist to supply them. So these facts should be taken into consideration, because they will serve to throw some light upon the present state of affairs, and possibly help us in the attitude we may take on this question, which must not be too radical. It is largely a local question; it is largely a question where you can hardly find two people that have the same opinion about it; therefore, I am opposed to having this question brought too much before the Pharmaceutical Associations, if there is any possible way that it can be

used to our disadvantage in the public press. But I am not opposed to hearing reports like this, of conditions in the various States to throw light upon the subject, so as to help our fellow-druggists."

Continuing, Mr. Hallberg said that the author had referred to the action in Chicago of asking the Board of Pharmacy to revoke the certificate of those that worked in stores that had a saloon license. Half a dozen of the greatest drug stores in Chicago for the past few years have had their windows filled up with all kinds of wines and liquors, at cut rates, and it seemed to him that if the Board of Pharmacy has any power at all, it certainly should have the power to revoke the license of any pharmacist that would work in a store where there was a saloon license. He believed that if there was an expression on it, possibly that might help. It would help wonderfully in Chicago if such a scheme as that could be carried out.

Mr. Mason, replying to Mr. Hallberg, said that he had spoken of the permanence of the liquor habit. He thought he was probably correct. Personally, in his study of the question he had never expressed any attitude on the prohibition movement. He might say that he did not believe in the prohibition movement, but believed in regulation instead. But he had never expressed any opinion on the question in discussing its bearing on the drug trade. He agreed with Mr. Hallberg that the druggists were between the upper and nether millstones upon this proposition. It is evident that the local-option movement is spreading all over the country, and thousands of saloons are being closed. But, as Mr. Hallberg says, the demand for liquor must be exerted somewhere, and it is in the direction of the drug store. It is up to the druggists to be courageous enough to resist this movement and to protect themselves against the ex-saloonkeeper who, under the guise of being a pharmacist, would cater to this demand. It makes no difference what the druggist may think about this matter personally; it is a great and practical question that confronts him, as the result of the spread of the local-option sentiment, and unless he meets the problem before him in the proper way it will surely lead to trouble.

Mr. Flint, of San Francisco, held that this matter of prohibition was one that did affect the druggist, and set a serious problem before him to solve. "We have been accused of making saloonkeepers of ourselves," said Mr. Flint. "We are not saloonkeepers, and the majority of us do not desire to be. But you will find that whenever a great movement of this kind is started, some unscrupulous people will seek to make money out of it, and try to cover up the evil by saying that they belong to a better class. This is the question we are confronted with, and we must meet it. We must use our legislative halls for the purpose of putting ourselves before the public in the true light, and if we do not do it of our own volition, these laws will pass in such stringent form as to make us do it." Mr. Flint said

he thought the Boards of Pharmacy throughout the United States could do a great deal. In reply to Mr. Hallberg's remarks upon the universal use of alcohol, and its necessity as an economic force, he reminded the gentlemen that in the last hundred years it had been an open question as to whether alcohol as a stimulant was required for the support and upbuilding of the human body; that scientific investigators of the present day had proven to the contrary—that we do not need alcohol, either as a stimulant or as a food. He said he was glad that the subject had been brought up for discussion, however, and it was probable something of value would be had from it.

Mr. John Uri Lloyd next discussed this liquor question, and reminded the members that the nations of the world traveled over the paths that other nations have traveled before them, but did not always profit thereby. He said a distinguished member of this Association, Dr. T. L. A. Greve, of Cincinnati, had discussed this question of prohibition with him some years ago. He was a temperance man, not a prohibitionist, and one of his arguments against prohibition was this: The Mahometans, the Turks, reached the walls of Vienna, and, but for the fact that Mahomet had prohibited the use of alcohol by his people, they would have conquered the world. But they could not long cope with the alcohol-drinking nations of Europe. Back they went, losing province after province, country after country, until now, so far as the little country of Turkey is concerned, it seems destined to be blotted out of existence by the alcohol-drinking nations about it. Mr. Lloyd went on to say that when he went to Turkey he remembered these words of Dr. Greve, and studied these people, and he found that no Moslem in Turkey touched alcohol in any way, shape or manner that he could discover. It was prohibited by the Koran, and that was enough. "Mahomet—whom I look upon as one of the greatest reform leaders the world has ever seen—had seen only the dissipation of his people. In working to make them a temperance people he declared that there must be *absolute prohibition;* so, to-day, every Moslem in that land follows the laws of Mahomet—the Koran. The Koran stands as a sacred word, and in the Koran alcohol is prohibited."

It was related that Mahomet had thus personally described the duty of the Moslem as follows:

If a well had been dug (equivalent) 100 feet in depth, and into this well one drop of alcohol falls, the well then filled with earth, and on this earth the grass grows, of the grass the sheep eats, no good Mahometan will eat the flesh of that sheep.

Mr. R. M. Green referring to Mr. Lloyd's remarks, thought if the physicians of this country were as conscientious in prescribing as the Turks were in obeying the law of the Koran, there would be little need for a statute regulating this traffic. As an illustration of the result to be expected from taking this matter out of the hands of the druggist and

putting it in the hands of the physician, he cited a case at Santa Ana where that was done, and the greatest demand for physicians' prescriptions was from the people who had opposed the saloon element; and so many came in that the druggist became disgusted, threw his liquor out and refused to have anything to do with it.

Mr. Philip Asher further discussed the opium question, and said that he was proud to say that the State of Louisiana had now a law prohibiting the sale of opium in any preparation except where it contained less than a quarter of a grain to the ounce, and any proprietary preparation which contained more than a quarter of a grain to the ounce could not be sold. He said that the Board of Health had taken this matter up, and in the last few months several convictions had been made upon such sales. Continuing, he said one point that was not generally known to the people was—and he believed it would be a solution of this question of traffic in narcotics, the fact that a federal law had recently been enacted to the effect that substances prohibited transportation in the United States mails cannot be sent by express from one State to another. He thought if publicity were given to this fact this traffic would soon cease.

Mr. Lichthardt said it had come to his notice last fall that the Chinese in that city had found a substitute for opium—a thing they called "hasheesh"—a combination of tobacco and cannabis indica. He thought the resin was probably extracted by taking the flowering plant and beating it so that the resin would flow out of it. It contained no chlorophyl. Probably forty or fifty per cent. of this substance was soluble in ether and thirty-odd per cent. was insoluble in water—he said he had forgotten the exact figures. It was sold as opium, and was flavored with some oil, the speaker thought. He said the National Government should absolutely prohibit the importation of these intoxicating substances that are used for such purposes—not the cannabis indica, or the flowering plants, but the different intoxicating preparations made therefrom. Mr. Lichthardt said he had some resolutions he desired to offer in this connection, and he would read them:

WHEREAS, The National Government has very rightfully safeguarded our people by prohibiting the importation of opium for illegitimate purposes; and

WHEREAS, It has been found that another narcotic and habit-forming drug, to wit, the various forms of cannabis indica as used in the far East as intoxicating agents, has been introduced to take the place of opium; and

WHEREAS, The American Pharmaceutical Association has ever opposed the importation, sale and indiscriminate use of all narcotics; be it

Resolved, That this Association request the National Government to pass such laws or regulations that would stop the practice of such importations into the United States of America.

Continuing, Mr. Lichthardt said he thought it was very important to the people of the Pacific Coast that some steps should be taken in this matter.

Quite a lot of Greeks and Hindoos were coming into the country from that direction, and nobody knew what they were bringing with them, and if these things were not stopped they would soon get beyond control.

Mr. Schneider seconded the resolutions just offered and the Chair invited discussion.

Mr. Kebler said the Government, as he had before stated, was always glad to get information of this character, and this was news to him. He thought it possible that this product was grown right here in the United States, as he had been informed that a considerable quantity of "hasheesh" was sent to Mexico from Arizona, where the National Government had no jurisdiction. He knew of no such product being imported; but if it was imported, and it could be shown that it was deleterious to the health of the people, it could be kept out under the federal law, and it would be done if the proper information was received.

On motion of Mr. H. L. Taylor, seconded by Mr. M. R. Mason, the resolutions proposed were ordered referred to a special committee of three, to be appointed by the Chair, for consideration and report later on.

The Chair stated that Mr. Beal had asked an extension of time on his paper on the program upon The Relation of Pharmacists to the Internal Revenue Department, as had also Mr. Remington as to his paper on Spanish Edition of the U. S. P. These papers would, therefore, be postponed to the afternoon session.

This brought the Section up with its business for the first session, except the nomination of officers for the ensuing year, and nominations for Chairman were called for. Mr. Asher said he had been informed that the present Chairman would decline a re-election, and he would like, therefore, to nominate Mr. Chas. W. Johnson, of the University of Washington, at Seattle, for this position. This motion was seconded by Mr. Osseward. Mr. Caspari said he did not like to interfere when a nomination was made, and particularly when such a good one was made, but as nominations would be open until the next session, under the By-Law, he would like to call attention to the fact that it had been customary in the Sections for some years past to elect the officers under a sort of civil-service rule, making some associate on the committee its secretary, and then promoting him to the chairmanship after he became familiar with the duties of the office. With this custom in mind, he would like to nominate for Chairman the present Secretary, Mr. Chas. H. LaWall, of Philadelphia.

The Chair asked if there was not a by-law forbidding the election of a man not present to the Chairmanship. Mr. Caspari replied that there was not, but admitted that the practice had not been followed as a rule—that it was a mere matter of custom. Mr. Asher thereupon withdrew Mr. Johnson's name for Chairman, and said he would nominate him later for Secretary. The Chair called for further nominations, but none were made.

Nominations for Secretary were called for, and Mr. Asher nominated Mr. Chas. W. Johnson, of Seattle, for that office. Mr. Hemm and Mr. Osseward seconded the motion.

Nominations for three Associates in the Committee were called for, and Mr. Caspari nominated Mr. Philip Asher, of New Orleans. Acting Secretary Stroup nominated Mr. Osseward, of Seattle, and Mr. Diggs nominated Mr. H. A. Peairs, of Los Angeles.

On motion, the Section then adjourned.

SECOND SESSION—WEDNESDAY AFTERNOON, AUGUST 18, 1909.

Chairman England called the Section to order at 3:30 p. m., and stated that the first thing on the program would be the presentation of Mr. Remington's paper on the "Spanish Edition of the U. S. P.," carried over from the morning session. Mr. Remington read his paper as follows:

SPANISH TRANSLATION OF THE UNITED STATES PHARMACOPŒIA.

BY JOSEPH P. REMINGTON, PH. M.

This work, which has just been issued, has found favor with pharmacists in Spanish-speaking countries, and it is significant that the year 1909 should go down in pharmaceutical history as the one marking two important events; the other, by no means the least important, the California meeting of the American Pharmaceutical Association in the flourishing city, bearing the beautiful Spanish name of Los Angeles.

Spain, the land of romance and of stirring history, now unfortunately in the throes of a civil, industrial and foreign war, has left upon the Western Continent, undying proofs of her greatness in the past centuries, and here, in this beautiful land of California, we are met at every turn with evidence of Spanish occupancy, and to one, born and bred in the East, familiar with geographical names and places taken from Great Britain or the native Indians, a visit to California impresses the traveler with the totally different civilization of former centuries.

To most people the Spanish language is beautiful, and while, as Americans, we are supposed to interest ourselves more in business and to use practical, short names that are convenient for our postmasters, sentiment is still to be found amongst us, and it adds greatly to the interest of our young people who visit California for the first time, to hear such words as San Francisco, Santa Barbara, Los Angeles, San Pedro, Alameda, Santa Catalina, Pasadena, etc., used every day. They have, of course, lost their beauty, in great measure, to California people, through familiarity, but there are not wanting daily evidences of the occupation of the country, in the past, by the Spaniards, and, if history is reliable, the record of Spanish occupation, here and elsewhere, did not always mean for the natives moonlight serenades and beautiful romance.

Fate decreed that the nation which was so powerful in the fifteenth century should, through the genius of a Columbus, start, in the "New World," a civilization which has become almost the direct antithesis of that of the parent country. The qualities characteristic of the Spanish people have been almost entirely obliterated by the spirit of "Young America," and idealism and the doctrine of "mañana," have given place to promptness, energy, and "do-it-now" methods, of which evidences are found on every side in the form of flourishing cities, progressive business houses and enterprising industries of all kinds.

The Spanish translation of the United States Pharmacopœia has been issued more from an educational motive than any other, the Board of Trustees believing that the islands which fell into the possession of the United States after the last Spanish war should possess a means of using modern pharmaceutical preparations, and indeed prepare for themselves American pharmaceutical products if they so wished.

Commerce is adapting itself, in all great countries, to modern methods. Instead of exporting products, bearing the labels and trade marks in the language of the country in which the goods are produced, the large houses have found it far more satisfactory to use the language of the country which buys the goods and, although this custom has been in use for many years, it is strange that it was not adopted at first.

The manufacturers who send to a foreign country, where the metric system is used, cloth or woolens, measured in English yards, are greatly handicapped in selling, while one who uses the metric system has a great advantage. Manufacturers for years have been sending their price lists to Spanish-speaking countries, and their traveling salesmen are frequent visitors. Fluidextracts, granular effervescent salts and compressed tablets, may be found in all of the Spanish-speaking countries, and their physicians prescribe them, but the advent of the new book will enable many of the larger pharmacies to make their own preparations, and widely spread the influence of the pharmacy of their northern neighbors.

The bitter feelings which were engendered by the Spanish war have largely passed away, and also the great burden and expense, which impoverished Spain, through her colonies, possessed, and it has been a relief to the old country, and although it may be many years before the islands will recover from the effects of misrule, the hope is promisingly held out that in time American occupancy will prove profitable in every way.

It is gratifying to the profession of pharmacy and a credit of no mean importance that one of the most practical ideas for benefiting the Spanish-speaking people has been the issue of this translation.

To those who have not seen the book, it should be said that it contains 25 more pages than the United States Pharmacopœia, due largely to the increased number of words made necessary by using the Spanish language. The mechanical execution of the book is as near that of our Pharmaco-

pœia as it could be made. The paper and binding are not suited to tropical and semi-tropical countries.

The work of translation has been excellently done by Prof. José Guillermo Diaz, who is an honored member of the American Pharmaceutical Association, and, with the members who were in attendance at the A. Ph. A. meeting in New York, who had the pleasure of meeting Prof. Diaz, he left the impression of scholarly attainments; and the fact that he conducts successfully a retail drug store in the City of Havana, adds greatly to his reputation.

As it was necessary to have proof-readers nearer to the publishers than the City of Havana, Louis A. Mátos, a graduate of the Philadelphia College of Pharmacy, of the class of 1872, was selected as one of them and Manuel de Pablo, of the City of New York, a professional Spanish writer, was the other proof-reader residing in the United States.

The publishers of the work are J. B. Lippincott Company and the agents, selected by the Board of Trustees, for marketing the book, are the American Druggist Publishing Co., of New York, President, A. R. Elliott. Inasmuch as the work must be brought to the attention of the Spanish-speaking pharmacists, this company employ traveling salesmen throughout the Islands and South America, to canvas for the sale of the work.

The Bureau of American Republics, having their main office in Washington, is an organization intended to foster relations with South American and Spanish-speaking countries. The Bureau have expressed a very lively interest in the publication of this Spanish translation and they will use their best offices in bringing it to the attention of the prominent officials, in the Governments and cities where the Spanish language is spoken.

It is too early to report the measure of success which will attend the enterprise but there seems to be no question, at the present time, from the orders which have been already received, that the Board of Trustees of the U. S. Pharmacopœial Convention will be able to pay all expenses, thus carrying out the original intention. It is not usual for Pharmacopœias to be published in a foreign language, but the peculiar circumstances arising from the Spanish war, furnished the raison d'ètre for this somewhat unusual publication.

The Chair stated that, without objection, the paper would take the usual course, and called for discussion.

Mr. Wilbert said he did not think Mr. Remington had brought out the fact that the United States Pharmacopœia was now the official pharmacopœia of the Island of Cuba. Last May it was adopted as the official standard in place of the old Spanish Pharmacopœia. Mr. Remington said he had omitted to mention that fact, and was glad to have his attention called to it. The U. S. P. is now the duly constituted official pharmacopœia of the island of Cuba.

Mr. Ford asked Mr. Remington if the Committee on Revision were authorized or expected to continue the Spanish copies of the Pharmacopœia. Mr. Remington replied that the Committee of Revision had nothing to do with the publication of this book, all business matters of this character being conducted by the Board of Trustees. He said this book was a literal translation. Mr. Ford said that he had seen objections stated to publishing a Spanish edition, the parties arguing that the publication should be confined to the English language. He was reminded that when he first went to Colorado the legislature was made up of so many Spaniards that nearly twice as many were sitting in the seats of the members as there were members of the legislature; that is to say, each member speaking the Spanish language only had an interpreter sitting beside him. The proceedings of the legislature were always conducted in English, but so large a part of the population was Spanish that the proceedings could only be conducted with the aid of interpreters, and there were as many copies of the proceedings published in Spanish as in the English language. That was long ago, and the number of Spanish-speaking people had gradually decreased until now very few are left in Colorado. Mr. Ford thought this this would be the keynote with our island colonies, to get them to adopt our language—to give them everything they wanted in their own tongue first. "Give them everything we produce," said Mr. Ford, "everything like the Pharmacopœia, and give it to them in their own language, and don't insinuate that we don't like to do it. By giving them what they ask they are more apt to gradually and thoroughly adopt our own language for their work." Mr. Ford said he would like to suggest to those who had influence in school matters that if the people of the United States are to be taxed to teach the children any language other than the language of the country, there was only one language that had any claims on the people, and that was the Spanish language. In his judgment it was the only thing to teach in the schools for practical business purposes. He knew of no instance where a child of American parents had learned enough German in the public schools to make any practical use of it thereafter. On the other hand, in Denver, where Spanish is taught privately to a great extent, the children learn to speak it fluently, and are delighted with it. Any one who gets a taste of the Spanish language comes to love it, and he did not think that could be said of the German language.

Mr. Berger endorsed the sentiments of the gentleman who had just spoken. He said as he spoke both German and Spanish, he thought he could give something like a fair judgment, and he was certain that the Spanish language was the more desirable in this country, and the language that would most attract the people. In Florida it was a pronounced advantage to speak the Spanish language. In Tampa and Key West there were at least fifty exclusively Cuban drug-stores, situated in the Cuban part of these cities, and very few American people frequented them.

These were altogether Cuban, and the people were highly impressed and pleased with the Spanish edition of the Pharmacopœia, and he hoped that succeeding editions would also be translated into Spanish and published, as it would be a very desirable thing for the Spanish-speaking people in his state.

The Chair called on Mr. Osseward to read Mr. Beringer's paper on modification of the regulations of the Food and Drugs Act, in the absence of the author:

THE USE AND ABUSE OF THE GUARANTY CLAUSE OF THE FOOD AND DRUGS ACT.

BY GEORGE M. BERINGER.

There appears to be an aversion among a large majority of those interested in the drug trade against discussing the provisions of the National Food and Drugs Act. This act is considered by some as one of the most radical pieces of legislation yet enacted by Congress and as placing in the hands of the Secretary of Agriculture and the officials of that Department an amount of arbitrary power that a few years ago would have been considered ultra-constitutional. The ideals of this law are correct and its principles receive the endorsement of every good citizen. On the other hand, we have a right to expect that the official exercise of the powers it delegates, shall be characterized by the most scrupulous honesty and fairness to the commercial interests affected so as to not unnecessarily interfere with legitimate business.

Loyalty to the principles of "purity in foods and drugs" and of "honesty in every transaction," should not deter us from critically examining every provision of law affecting our trade, and fear that statements will be misconstrued and motives questioned, if such discussions are engaged in, is unworthy of those who have the courage of their convictions.

The present law is a very long step in the right direction, but signs are appearing that it is not altogether satisfactory to some trade interests and that it is all that some of the government officials desire.

Consideration of the "Guaranty Clause" necessitates a joint consideration of Regulation No. 9 and Section 9 of the Act as the former is but the rule laid down for carrying out the provisions of the latter and incidentally it attempts to define and construe the meaning of this section. Section 9 is a very important feature of the law. Its intent is to protect the intermediary between the manufacturer or producer and the consumer, the dealer, from improper prosecution and relieve him from a responsibility which is not rightly his and to place the responsibility for quality of the product and the proper branding or labeling of each article upon the manufacturer, producer or packer.

A strict construction of the wording of Section 9, I believe would require, for the protection of the dealer, a guaranty "*signed* by the whole-

saler, jobber or manufacturer" with each sale. Again, it must be direct as well as personal as the act specifies that "said guaranty, to afford protection should contain the name and address of the party or parties *making* the *sale* of such articles to *such dealer*." This language of the law recognizes no intermediary in the sale. Under the primeval conditions of barter and sale such a system of direct and personal guaranty might have been possible, but under modern conditions of trade and commerce, it is impracticable. The wording of section 9 of the act is certainly open to criticism.

It was to make a rule and establish a method of procedure that was practical and which recognizing the modern methods of transacting business would still afford the relief intended by section 9, that the commission framed Regulation 9, and placed a somewhat elastic construction on the wording of the act. There is nothing in the act itself that provides for a "general guaranty" filed with the Secretary of Agriculture. This is a clever idea created outside of the act an "artifice introduced by the commission.

The principle involved is that of justice to the dealer, to protect him from improper prosecution and to insure his immunity from liability in the wrong acts of manufacturers and producers, which he innocently transmits through the regular process of business, without intentionally sharing in the wrong. By the regulation, the government is seeking to aid him in establishing a guaranty and securing the immunity and protection intended by the act. But there is a very grave doubt if a "general guaranty" filed with the Secretary of Agriculture is such a "signed guaranty" as is contemplated by the act itself. The wording of this sentence of the act providing for a *signed* guaranty when considered with the context, from which it cannot be dissociated, seems to indicate that a direct and personal guaranty was necessary to afford protection. It is exceedingly doubtful if this "quirk" of the regulations would successfully withstand contention in the courts.

However desirable the construction of the act, given in Regulation No. 9, however important its bearing on trade practices it must be kept in mind that the act itself is the law and not the regulations. True, Section 3 of the act imposes a duty upon the Secretary of the Treasury, the Secretary of Agriculture and the Secretary of Commerce and Labor, "to make uniform rules and regulations for carrying out the provisions of this act"; but no authority is given or can be given to alter, to amend, to modify, to extend or to curtail the provisions of the act itself or to provide subterfuges and any such attempts would be ultra-vires.

The act provides that the guaranty must be made by a "party residing in the United States," so that no protection, in this sense, is afforded or can be expected from foreign manufacturers or producers or dealers. It is to be noted that the various state acts have copied into them bodily the

idea of a direct and personal guaranty and incorporated the idea of residence of the guarantor. The Food and Drug laws of Arkansas, Colorado, Florida, Georgia, Massachusetts, North Carolina and State of Washington all have limited the protection of a guaranty to "a guaranty *signed* by wholesaler, jobber or manufacturer *residing* in the state" and quite a number of the State laws have even gone to the limit of requiring that the guaranty on the label "must *specify their State act.*"

It required the most strenuous efforts of an energetic committee of pharmacists to convince the astute legal advisers and law-makers of one state that state residence of guarantors and direct and personal guaranties were not practicable. That while such might possibly be obtained by the milk man who dealt in only one commodity and usually with only one or two producers, it was not applicable to the druggist who handled thousands of small articles produced all over the world, and whose dealings were with a number of widely distributed manufacturers and jobbers.

It is entirely pertinent to consider the guaranty clause as exemplified in the approved wording or "legend," "Guaranteed under the Food and Drugs Act of June 30, 1906," officially directed to appear with the serial number on each and every package of goods sold under a filed general guaranty. Has this wording or plan proven to be satisfactory? Has it proven to be a real protection to the consumer against deception, fraud and adulteration? The honest manufacturer needs no law for his guidance and his products will be true in quality and label without any law. It is significant of the spirit of loyalty to the law that actuates the drug trade that no effort or expense has been spared by the pharmaceutical manufacturers, and that millions of labels were reprinted at an enormous expenditure in order to comply with the provisions of this regulation.

The fact that the Commission had outlined a method for the protection of the dealer and consumer, and that the government assigned the serial number and framed the "legend" to be used in connection therewith on labels, appears to have been only an incentive to the unscrupulous to indulge in further fraud, misrepresentations and sharp practices. The official acts of the Department of Agriculture in such minor matters as provided for in Regulation No. 9, have been heralded in advertisements as government endorsements. The serial number has proven to be only a loop hole for a number of new forms of fraud, and the "legend" a new cloak for deception. Preservatives and other objectionable products have been sold to the ignorant and unwary under the representation that the government had issued the serial numbers as a government endorsement. The drug trade has witnessed the introduction of a host of a new class of proprietaries advertised as ingredients in fake prescriptions and household mixtures under fanciful names, protected by "trade mark" and with a serial number and the official legend on the label.

To the ignorant, the serial number appears as a quasi government en-

dorsement, and this erroneous idea has been nurtured and assiduously circulated by unscrupulous manufacturers and distributors. So frequent and so annoying has this abuse of the "guaranty clause" become that the department has been compelled to modify the original wording promulgated, and direct that hereafter the legend shall read, "Guaranteed by —— under the Food and Drugs Act, June 30, 1906."

One Congressman who has taken great interest in the subject of food and drug legislation, and who was very active in securing the enactment of the present law, introduced into the last session of Congress a bill which proposed to eliminate all such statements from the label. So it is apparent that this abuse has become a serious problem and bids fair to compel modification of the law in this very important feature. It behooves the pharmaceutical interests to carefully watch such amendments or modifications in order to see that the full measure of protection against fraud and improper prosecution is secured to the dealer. This section of the law itself should certainly be more specific and practicable, and, in the writer's opinion, the character and form of the guaranty should not be left to changeable regulations, but should be stated and fixed in the act, and a penalty be attached for any misrepresentation of the wording or meaning of the guaranty clause either in the label or in any circular or advertisement.

The Chair invited discussion on the paper just read, but there was none. It was then ordered to take the usual course.

The Chair stated that this cleaned up the work left from the morning session, with the exception of a paper by Mr. Beal, who had asked for further time until late in this session.

Further nomination of officers was called for as the next order of business, and the following were named by the Chair as having been nominated at the morning session: For Chairman, Chas. H. LaWall, of Philadelphia; Secretary, Chas. W. Johnson, of Seattle; Associates, C. Osseward, of Seattle, Philip Asher, of New Orleans, and H. A. Peairs, of Los Angeles. Other nominations were invited. Mr. Searby, seconded by Mr. Wilbert, moved that nominations be closed and that the Secretary cast the affirmative ballot of the Section electing the gentlemen named to the several offices designated. This motion prevailed, the Acting Secretary announced that he had cast the ballot as directed, and the Chair declared these gentlemen duly elected.

At request of the Chair, Mr. Wilbert then presented his paper on post-graduate instruction.

THE NEED FOR POST-GRADUATE INSTRUCTION.

BY M. I. WILBERT.

With the constant increase in the sum total of human knowledge, the need for specialization, and the consequent dividing up of the more primitive lines of occupation, the physician can no longer be expected to be familiar with botany and pharmacognosy, the chemical composition of plants, the rapidly developing resources of chemistry, or the possibilities of galenical pharmacy. For all these many and varied lines of information, information that is so vitally important to the restoration to health of the sick and afflicted, he is dependent on us, the pharmacists of this country. Unfortunately however for the particular branch of the healing art that we represent, unfortunately for ourselves and more unfortunately for the members of the community whose health and lives we are expected to assist in preserving, the foundation of our general knowledge has not been laid sufficiently wide and deep nor has the superstructure of special training in pharmacy that we have received been sufficiently thorough to insure the possibility of our commanding the undivided respect of those whom we are designed to serve.

The medical men in this country have long since recognized that in the four years of study that are now required by the greater number of medical schools only the bare fundamentals, the rudiments of the science of medicine can be taught, and that it requires constant study and close application during all of the remaining years of a physician's life to make him really a "doctor"—one who is learned in his particular line.

As pointed out above, the time devoted to the study of medicine, though much greater than it was a decade or more ago, is still insufficient to give the student a general insight into the problems connected with pharmacy, botany, chemistry, and the cognate sciences, and it is along these lines that his knowledge should be augmented by the properly prepared and thoroughly earnest professional pharmacist.

Before essaying to pose as the assistant, instructor, or collaborator of the physician, however, we must, individually, recognize our own shortcomings and endeavor to enlarge upon and to perfect our own fund of knowledge. We must recognize that taking representative institutions of medicine and pharmacy, we find that the leading schools of medicine, in this country, require a collegiate degree as an entrance requirement while the leading pharmaceutical schools are really content with a grammar school education. The total number of hours of instruction in medical schools aggregate from five to six thousand, while the leading pharmaceutical schools are content with a maximum of from twelve to fifteen hundred hours of study for the required degree.

We must also realize that the subjects now taught in our colleges of Pharmacy are most rudimentary and are but inadequately fitted to supply

the necessary foundation for future elaboration and that there is, as yet, no evidence that pharmaceutical schools are pointing out, as they should, to their students the need for elaborating on the meagre foundation of learning that is being furnished them.

To the credit of the American Pharmaceutical Association it must be said that the members have at least inaugurated the possibility of broadening the meager foundation of professional training offered by our present-day colleges of pharmacy, and there can be no doubt that through its continued influence the fund of knowledge of present-day pharmacists is being enlarged upon and that, ultimately at least, the educational facilities that will be offered to future generations of pharmacists will be of a character that will assure infinitely better results.

It has been asserted that one of the more potent reasons why the apothecary of to-day stands no higher in the esteem of the community is because he has enlarged on the business side of his occupation at the expense of its professional aspect. Manufacturing pharmacists and drug jobbers are no more the essentials of honesty than are manufacturers and jobbers in other lines of trade, and the tests laid down in the Pharmacopœia of the United States are not devised for the importer or the manufacturer alone, but for the distributor as well.

H. E. Barnard, the State Food and Drug Commissioner of Indiana, in a circular of information to the drug trade, points out that "the guarantee is a protection against prosecution only in the case of goods in the original package, but as soon as the box is opened, stopper drawn or seal detached, the guarantee ceases and all responsibility for the character of the goods passes from the manufacturer or jobber to the retailer."

There can be no denying the fact that comparatively few pharmacists in this country are thoroughly cognizant of the provisions of our National Pharmacopœia or able to apply all of the various tests that are prescribed in its pages. While it is undoubtedly true that our pharmacopœia is, theoretically at least, one of the most elaborate and technical, it does not represent the actual practice in American pharmacy, or, perhaps more accurately, the present-day development of the average pharmacist.

In this connection it may be advisable to consider the adoption of the requirements, made in many of the foreign pharmacopœias, that all apothecary shops be required to have on hand certain of the official articles of the required purity, that the pharmacist be held directly responsible for the identity and purity of these several substances, and that, to insure his being able to apply the several pharmacopœial tests, he be required to have on hand the several appliances and reagents that are prescribed by the Pharmacopœia. It might be advisable to restrict the official tests, as has been done in the Swiss and other foreign pharmacopœias, to such as can, should, and must be applied by the pharmacist to insure the identity and purity of the materials he supplies.

Despite the fact that the Swiss Pharmacopœia is by no means as technical as our own, and despite the fact that the Swiss pharmacist is much better prepared for complying with the several requirements than is the average pharmacist in this country, the Swiss universities have arranged and successfully conducted courses of post graduate instruction for pharmacists, to fit them to comply fully with all of the requirements of their National Pharmacopœia.

At least a beginning has been made in this country along the same lines. The University of Wisconsin School of Pharmacy has announced a post-graduate course, and during the past winter the Philadelphia Branch of the American Pharmaceutical Association inaugurated and successfully conducted a series of post-graduate lectures and demonstrations that will serve to illustrate the lines along which pharmaceutical education in this country must be elaborated and developed if the pharmacist is to continue, as he should, in the capacity of assistant and adviser to the physician.

Among the features that were elaborated on in the Philadelphia course are the possible uses of the compound microscope in connection with the detection of adulteration ; the need for applying the tests for identity and purity as well as the assay processes of the Pharmacopœia ; the need for keeping in touch with the advances that are being made in the several branches of chemistry that are of more or less direct interest to pharmacy, and the need for becoming familiar with the possibilities in connection with the pharmaco-dynamic action of medicinal substances. It is in connection with this latter subject, particularly, that the present day course in pharmacy, in this country, is particularly weak.

To develop a realization or a proper appreciation of the possibilities of scientific pharmacy our schools should include, in addition to a thorough course in botany, at least a fair grounding in zoölogy, comparative anatomy, physiology, toxicology, and experimental pharmacology.

It is the absence of a thorough grounding in the knowledge of the normal functions of the animal organism and the influence of drugs on these functions that has fostered the present wide-spread promiscuous sale of active medicinal substances in the guise of household remedies or patent medicines, and has contributed so largely to the self-conceit that is so frequently evidenced in the present day *propaganda* in which we pharmacists essay to *teach* physicians Materia Medica and Therapeutics.

There can be no mistaking the fact that in what we have been pleased to call *propaganda*, the popularization of the U. S. P. and N. F., we have entered upon a very laudable undertaking in the wrong way. We have undertaken to criticize physicians without taking into consideration our own faults and shortcomings, we are preaching in place of practicing, we are attempting to teach without ourselves being properly fitted for the task.

To live up to the best that is in us, to live up to the ideals of the

founders of American pharmacy, to live up to what may be rightfully expected of us by the community at large, we must earnestly and honestly strive to attain the knowledge that is needed for us to comply with the various requirements made of us in the routine of our daily occupation. Unless we can, as we legally must, guarantee the identity, purity, and activity of every medicinal substance that passes through our hands, we are not complying with the requirements that are expected of us, we are not living up to the ideals of the professional side of our occupation, and we are surely not in a position to criticize the medical man for not according us the confidence that we should and must exact.

Discussion was invited upon the paper just read, but no remarks were made, and the paper was referred, to take the usual course.

The Chair called for a paper on the rules of botanical nomenclature, by Mr. Rusby. Mr. Rusby said that, as his paper was quite technical, he would suggest that it be read by title only and referred, as he thought it was a paper that could be much better read than presented verbally. The suggestion was agreed to, and the text of the paper here follows:

THE RULES OF BOTANICAL NOMENCLATURE.

BY H. H. RUSBY, M. D.

The printed rules of botanical nomenclature fill a small pamphlet. To be intelligible to those of you who are not familiar with their use they require interpretations, in some cases quite extended. These interpretations sometimes differ, even among experts, and long discussions are required to reach a unanimous, or even a majority, agreement. Such a discussion is now in progress concerning one of the rules. It will thus be seen that it is an embarrassing task to discuss this subject in ten minutes, a task that is undertaken only at the request of the Chairman of this Section.

Rules of nomenclature are seen to be required when we consider that there are, on an average, several names for each plant, and that in many cases the same name has been applied to more than one genus or species.

The rules necessarily originate with individuals, who promulgate them, either locally in verbal discussion, or more widely through correspondence or publications. It is natural that local discussion should be more thorough, and so it happens that agreement is more likely to exist in one country, or a section of a country, than internationally, and that the view and practice in different countries are quite likely to differ. This fact leads to international congresses, where an attempt is made to secure international agreement in view, or in practice, or both. A number of such congresses have met, but the results are not satisfactory, chiefly because of the influence of selfish consideration in their proceedings. When practice in any one country has differed from the proposed rules, as it almost always has in some important direction, yielding by that country means

the nullification of much of its botanical literature, representing the life-work of individuals, and it is not to be wondered at that great difficulty is encountered in securing such sacrifices. Thus, at the last Congress the German botanists packed the meeting, though by perfectly legitimate delegations, and voted for rules of exception in direct and serious conflict with the most important principles, apparently for no other purpose than to preserve the standing and influence of the erroneous nomenclature of their own literature. Since these rules mutilated the history and literature of other countries, correctly founded upon the principles adopted, they were repudiated by the botanists of such countries, and the objects of the Congress were not attained.

Such influences tend inevitably toward the formation and establishment of two very distinct systems of nomenclature. The first may be called the exact system, that based upon historical and scientific truth. It requires that the first name ever applied in such a way that its object is clearly indicated shall prevail, and that all names subsequently applied to that object shall be expunged. This is the rule of absolute priority in botanical nomenclature. It is espoused by the leading authority in French botany and by some high, but not at present dominant authorities in America, England and other countries. It therefore does not prevail. Nevertheless, it is steadily gaining ground by the quiet, persistent and very scholarly work of competent botanists, in producing one work after another based on the system. It is quite evident that the final and permanent establishment of this as the only system is merely a question of when the necessary literature shall have been produced.

The other system may be designated as the working system. It is obvious that botanical names must have an intelligible meaning to those who use them. Some of those who espouse the exact system assume that those to whom their nomenclature is not intelligible are of no account, because of their deficient learning, and that all the literature of such people is worthless, and should be disregarded. This idea is impractical and impracticable. The number of branches of science, and the vast material interests, whose development and progress require the use of botanical nomenclature, cannot be ignored, so that the working system, however inexact, is the one in which people are now the most interested, and the one here to be considered.

In 1735, Linné published his *Genera Plantarum*, in which he diagnosed the genera of plants and assigned a name to each. Therein he proposed many genera which had previously been unknown or unrecognized. For these he necessarily proposed new names, and these names must stand under the exact system. To some genera which had previously been known and recognized he assigned the names originally given them. These names will also stand under the exact system. Unfortunately, there were many others which had been known and recognized for which

he proposed other names than those originally applied to them, and some of these names had originally been applied to other genera. Such names of course cannot stand in an exact system; all must be restored to their original meaning and application. For the working system, however, botanists have agreed to adopt all names assigned by Linné in this book, and so the fundamental rule of this system is that botanical nomenclature begins with the *Genera Plantarum* of Linné, in the year 1735. Let me take, as an illustration, the name of our beggar-ticks, those plants whose flat, more or less triangular seed-pod joints, commonly called "seeds," adhere to our clothing by their rough surfaces, when we go through the fields and woodlands in late summer and fall. Linné assigned to this genus the name *Meibomia*. Later, someone else proposed for certain species of this genus the name "*Desmodium*." Subsequent authors used the latter name instead of that of Linné, and so, as the species multiplied by scores, over a large part of the world, the incorrect name *Desmodium* came to exist generally in the botanical literature of all countries. To correct this error, it will be seen, necessitates the re-naming of perhaps hundreds of species. To do the same for all those other genera which occupy a similar status means practically the publication of an entirely new set of botanical works throughout the world, if the International Congress should adopt this rule. It will also be seen that when the inevitable occurrence supervenes of the adoption of the exact system, all this literature may have to be again replaced by a new one. Now comes the question, since we are forming a working nomenclature, not claimed to be exact, but used for its convenience, why not agree on the use of names which are current in literature for these very large genera, even though such use violate the rule of Linnean priority. This was the view of the Germans at the Congress above mentioned, and had they been sincere and consistent, the action of that Congress would doubtless have been unanimously accepted, but they lost an opportunity by abusing the rule of exception, through its application to many genera which were not large, and where the object was merely to maintain errors of nomenclature which had been committed by their own people. Disgust at this unprofessional action led to revolt against the acts of the Congress.

Genera the publication of which was subsequent to the starting-point named, must of course bear the names first assigned to them.

It thus happens that although but one species of a genus was published in connection with its original name, and hundreds have since been published in connection with its incorrect one, the hundreds have to be changed to agree with the one, that is, for example, all species published as *Desmodium* must be republished in *Meibomia*. In botanical parlance, this is expressed by saying that they are to be transferred from *Desmodium* to *Meibomia*.

Heretofore, I have spoken of rules for generic names only, but there

are also rules for specific names which must be observed in this process of transfer. Here the same rule of priority prevails. The first species name given to a plant, not antedating the above-mentioned work of Linné, must prevail, displacing any other specific name that may subsequently have been applied to that plant, no matter how widely it may have been published, nor how firmly fixed in literature. Our official lady's-slipper was originally called *C. hirsutum*. Without any justification, it was later named *C. pubescens*, and this name was generally employed in botanical and medical literature. When the rule of priority assumed authority, the proper name was of necessity restored.

There are several complications affecting specific names which may interfere with the working of this rule. There must not be two species of the same name in the same genus. Hence, when it is decided that one genus is not distinct from another, and that its species must be transferred, if there is a plant in each genus bearing the same specific name, a new name must be found for that one to which the common name was latest applied. Such common names are called "Homonyms," and there is a rule which says "once a homonym, always a homonym." This means that a name that has once been applied to a plant and has afterward for any reason lost its application, can never be employed for any other plant in that genus, or for any genus, if it is a generic name. For example, if a golden-rod is called *S. arguta*, and is then found to be identical with a species originally known and named, the name "arguta" can never be applied to any other "Solidago" subsequently discovered.

We have seen that there are two classes of botanical names, the generic and the specific. Each of these may belong to more than one plant without violating any rule. Thus, the generic name, "Solidago," belongs to all the golden-rods, while "arguta" belongs not only to a certain golden-rod, but to many plants in other genera. Yet each plant must have a name that cannot be elsewhere applied, in order to avoid possible misunderstanding. Such a name is made by combining the generic and specific names in the "binomial," as it is called. Now, although we say that a binomial cannot be applied to more than one plant, what we really mean is that such duplicate use of it cannot prevail. If, as has very frequently occurred an author applies a binomial in ignorance or carelessness of the fact that some one else has previously applied it differently, we can never get rid of that synonym, unless we were to destroy every existing printed and written copy of it. Thus, we have in botanical literature many binomials which belong to different plants, and a way must be found for making known to the reader which one is intended when that binomial is used. This is done by affixing the name of the author of the binomial. A complete botanical name, therefore, includes three name-parts, the generic, the specific and the authoral.

It has long been my opinion that the use of the author's name, when not

required by duplicate use of the binomial, is a barbarity in a working system. This complete name should of course be recorded somewhere in an authoritative list, such for example as the *Index Kewensis*. When it is used the letter "K" placed after it to show that its application is that therein recorded, should be sufficient, if it has never been used in more than one sense. If it has been so used, then of course the printing of the author's name is requisite. Such a custom will obviate the necessity for the author's name in all but a fraction of a percent of cases, and would be a great boon to working people. The German Pharmacopœia has adopted this method, but without the safeguards here suggested, and the practice can scarcely be approved. It remains to be pointed out that in some cases it is appropriate to use two authors' names, when one author named the species, but in a wrong genus, and another transferred it to the proper genus, becoming thus the author of the binomial. In this case the name of the author of the species goes in parenthesis, and precedes that of the author of the binomial. If a binomial is seen printed with but one author's name and this in parenthesis, it means that that is the first time that the name has appeared in print; that is, that the transfer is being published by the author of the article in which it so appears.

Mr. Schneider, of San Francisco, was then given an opportunity to present the following paper he had prepared upon the teaching of botany:

ON TEACHING BOTANY IN THE COLLEGES OF PHARMACY.

BY ALBERT SCHNEIDER.

In the presentation of this subject two assumptions are submitted to which all present will no doubt subscribe.

1. That there is a distinctive branch of science or learning designated as botany.

2. That the study of botany as a distinctive branch of science or learning has a recognized place in the curriculum of the college of pharmacy.

These assumptions being admitted we will formulate the thesis as follows. Botany is not an independent or isolated aggregation of technical data but a branch of the natural sciences, and in teaching this subject the chief aim should be to elucidate and make clear the interrelationship of this and the other branches of natural science. This thesis may be more fully set forth in the following statement.

We are the product of nature and all of our major operations and interests are centered in nature. It is therefore but natural that the study of nature and natural phenomena should be considered of greatest interest and of highest importance. The facts deduced from the observations of nature have in time been segregated in groups which we now recognize as the different branches of the so-called natural sciences. The original nature knowledge was always one with the natural observation and the terminology used to express such knowledge was always associated with

the natural phenomena. At the present time nature knowledge or natural science is treated largely as a catalogue of classified technical terms. This applies to botany even more than it does to the other sciences. In teaching botany we should attempt to bring the student *en rapport* with nature along certain specialized lines or avenues. This state or elucidation sets forth an opinion regarding the present comprehension of the science of botany as a so-called natural science and as it should not be taught and we shall now enter upon the discussion of the thesis.

Botany is recognized as the youngest of the natural sciences. It received its major developmental impetus at a time when zoology, astronomy and chemistry had already reached the stages of systematized classification. This very fact explains why the botany of to-day is largely a catalogue of plant names and of botanical terms. The first efforts were not to determine what the plant was, how it grew, where it originated, and what work it performed in the economy of nature, but rather to give it a name and place in a plant catalogue. It is true that in the effort to catalogue the plant it became necessary to study it more or less carefully; however such study is misdirected by the fact that the prime object is not to ascertain the place that the plant occupies in nature but rather to name it. This misguided effort is forcibly and glaringly illustrated in the work of the modern species hunter or systematic botanist who spends his whole lifetime in the quest after new plants, new species, new varieties, new forms, new synonyms and who creates species that have no actual existence. Simply because of his lack of nature observation he is not aware of the possible extremes in form variation. Different parts of the same plant have been described as new and distinct species. Again the same species from different localities have been described as distinct species, simply because the over-hasty species hunter (designated *Heusammler* by the Germans) failed to note the effects produced by differences of altitude, climate and environment generally. The purely scientific botanist goes to the opposite extreme. He devotes perhaps a lifetime to the study of the probable function of the nuclear membrane of *Lilium martegon*, the probable function of the nucleoli in plant cells, cell-wall formation, the nuclear spindle, the directive spheres, karyokinesis in a given species, etc. Often the weary scientist has studied the cell nucleus for many years without even knowing what the plant of which he has studied one cell looks like in its natural environment. What is in the name and what matters it whether a given cell-wall is formed in the horizontal or vertical plane? A man's name signifies nothing. What we wish to know about him is, can he be depended upon as a friend and as an enemy, is he honorable or dishonorable in his dealings, is he or is he not interested in human welfare, is he neighborly or is he a recluse, is he cultured or is he vulgar, in other words is he a desirable or objectionable individual in the community. The facts that his name is Smith, Brown or Jones, that he

lives on A or B street, that he is a member of the lodge, has a title, has money, dresses well, etc., are of no real consequence and will in any case become known as we study the real man. Thus in teaching botany the important facts are not the mere names and definitions as for example,

Taraxacum, the roots of *Taraxacum taraxacum* (L.) Karsten, having synonyms as follows:

Leontodon taraxacum Linné.

Taraxacum officinale Weber.

Taraxacum dens-leonis Desfontaine.

Taraxacum vulgare Schrank, of the family *Cichoriaceæ*. A plant with a whorl of radical deeply cut, pinnatifid or runcinate leaves. Heads many flowered on a slender, hollow scape. Achenes oblong-ovate to fusiform, 4–5 ribbed, bearing a copious white capillary pappus, etc., etc. The better method is to emphasize along the following lines: Taraxacum, the roots of *Taraxacum taraxacum* Karst., of the family *Cichoriaceæ*, commonly known as the dandelion, a popularly known cosmopolitan plant which through certain special evolutional development of leaves (basal whorl of large leaves which choke off the surrounding vegetation) and seed (numerous seeds on a tall stalk, each with a parachute arrangement to aid in dissemination through the agency of air currents) has gained such advantages in the tense competitive struggle for existence that it has become the most common and most widely distributed plant in existence. The plant has long been valued economically. The young leaves are eaten as greens or salad by the poorer classes of all countries, and the roots are official in nearly all Pharmacopœias, and in some countries, as Germany, the entire plant is official, etc., etc. Historical data, data on collecting, drying, etc., could be added as time would permit. In other words, teach botany interestingly by dwelling upon the facts pertaining to the nature of the plant itself in its relationship to the rest of nature, rather than to lay the stress upon the mere technical terms used in the study of botany. After we are familiarized with the real nature of the plant, we will find that the botanical name, family name, words descriptive of leaves, flowers, fruit and seed, etc., will have come to us without conscious effort.

The following are the chief reasons why botany as a study is uninteresting. The systematists have made botany a mere catalogue of names and technical terms as dry as the plants filed away in the herbarium, and the so-called scientific botanists offer such a very limited view that between the two it is little wonder that the student is discouraged rather than encouraged. Fortunately there are coming into existence a number of authorities on bacteriology, zymology, agricultural botany, physiological botany, ecological botany, economic botany, geographical botany, and commercial botany, who are rapidly instilling new life into this more or less decadent branch of natural science.

The defects and shortcomings above referred to must be considered by

every teacher of botany in colleges of pharmacy. It rests with him whether or not he presents the subject interestingly. The teachers of botany in colleges of pharmacy must take into consideration the following:

1. The educational entrance requirements to the college of pharmacy.

2. A proper time apportionment of botany to the other branches taught in the college of pharmacy.

3. The proper didactic relation or sequence of botanical study to the other branches taught in the college of pharmacy.

A teacher of botany in a college of pharmacy demanding high school graduation as an entrance prerequisite must formulate his course of instruction differently from the teacher of botany in a college having no high school requirements whatever. As to time apportionment, one year is certainly all the time that can be spared to botany, and naturally this should be the first year of the usual two years' college course. As the course in botany is a necessary preparation to the courses in pharmacognosy and materia medica, it must be suitably adjusted. Lastly, botanical instruction must be suitably adjusted to the progress in pharmaceutical science. The following is an outline of botanical instruction as it should be given in leading colleges of pharmacy as they now exist:

1. *Lecture Course.*—One lecture a week throughout the junior year, explaining the essentials of plant morphology and physiology, the relationship of botany to pharmacy, medicine, zoology, chemistry, with incidental reference to the physical phenomena involved in plant growth, as light, heat, cold, gravity, etc. Explain the essentials of soil fertility, soil chemistry, soil bacteriology. Much stress should be laid on plant ecology, plant distribution, origin and development of domestic economic plants, methods of cross fertilization, creation of new and desirable varieties. The history and development of medical botany, cultivation of medicinal plants, the active constituents of medicinal plants, etc., should be explained. Symbioses, the relationship of plant groups, plant societies, relationship of plants, insects and higher animals, plants in relationship to altitude, latitude and climate, should be explained. As the time allotted is very short, the lectures must be very carefully outlined in order that the various phases of the subject may be presented in logical sequence and that the ground may be well gone over. Rambling, illogically-arranged lectures cause confusion even though they may be interesting.

2. *Field and Herbarium Work.*—Class excursions should be made into the neighboring field and forests to make actual observations on how plants live, grow and have their being. Notes should be taken regarding actual observations on plant societies, competition for soil, space, light, moisture; special structural adaptations in the struggle for existence, etc., In other words, these field excursions should supplement the lecture course. There are several serious obstacles in the way of carrying out this

scheme. The great majority of students are about as irresponsible, and as awkward to control as a lot of three weeks' old puppies. Most of them will persist in making these excursions a series of picnics. Also the weather and seasons prevent many excursions; this is particularly true of colleges in the north, east and central west. In California, for instance, such excursions could be made throughout the year, excepting a few, which might have to be abandoned on account of rains. Perhaps on an average, not more than eight such excursions could be made during the year, arranged to suit the climatic conditions of the state in which the college is situated. To compel attention on the part of the student and to obtain the best results, students should be informed in advance of the place or places to be visited, mentioning the things of interest likely to be met with, and asking each student to take notes on the observations made. During the week following each excursion there should be a written or oral quiz on the observations of the excursion. The teacher and his assistant must of course be present at each excursion to act as guides, and to offer suggestions and explanations. At a suitable place a half hour halt should be made, during which the professor in charge should give a short talk on the more important observations made.

Each college should have a small garden of medicinal plants for the benefit of the students. Convenient nurseries, greenhouses, economic gardens and conservatories should be visited. Lastly, in order that students of pharmacy may know how the systematic botanist classifies plants, he should be required to collect, dry, mount and correctly label from twenty-five to fifty of the more common available wild-growing plants in the vicinity, naturally giving the preference to those plants having medicinal value.

Laboratory Work.—Owing to lack of time, laboratory tests on plant physiology must be largely, if not wholly, omitted. Some simple class demonstration on plant growth, influence of gravity and light on plant growth, transpiration, root pressure, etc., might be made. They are very interesting in themselves and would certainly serve to keep up the interest in botany generally. However, the major laboratory work will consist of a macroscopical and microscopical examination of plant types taken from the major groups of plants, in the order of progressive phylogenetic relationship, as Algæ, bacteria, higher fungi, lichens, liverworts, mosses, club-mosses, scouring rushes, ferns, cycads, palms, conifers, lily, grasses, and several groups of the higher flowering plants.

Two two-hour periods each week during the entire junior year should be devoted to this work. Perhaps one weekly period of three hours each would be better suited to the arrangement of courses in the majority of colleges. Each laboratory period should be preceeded by a talk of from ten to twenty minutes on the essential facts of the plant group under observation and study. The students should then be requested to

make a careful macroscopical examination of the specimen before them and make a drawing of what they have seen. Next they should make free-hand sections, to be properly mounted and examined microscopically, again making drawings of what they have seen. The microscopical work is most important, because it lays the foundation for the second year's work in pharmacognosy and the third year's work in the critical examination of drugs, spices and related products, in conformity with the demands of the pure-drug laws, federal and state.

California College of Pharmacy, San Francisco, Cal.

This paper provoked quite a discussion, in which Mr. Searby, of San Francisco, took the lead.

Mr. Searby said he had made some feeble attempt, temporarily, to teach a little botany—he never knew much about it himself. Botany is like anything else: if we wish to teach any branch of knowledge, we must first get the student interested if he is to avail himself of the instruction offered. We must show him something in it that is worth his while to know. In schools of pharmacy he had heard the complaint made frequently that in the botany course they gave a lot of stuff they never had any use for, that threw no light upon their pharmacy work, that added no new interest to their *materia medica*, and so on. That is the fault of the teachers. There is no effort, as Mr. Schneider has shown, to interest pharmacy students in botany. He well remembered when he was a student in a school of pharmacy in London, where they spent two whole months and never got beyond the simple cell. Not a soul of them had ever handled a microscope, and would not have known what to do with it if they had had it—although the professor did show them certain slides under the microscope. Out of twenty-one in the class he was the only one that showed any interest in the study of botany, and that was because he knew something about it before he went there. This experience showed the utter failure of certain methods of teaching. If the student is to be taught anything, the teacher must come down to his level and present the matter in a way that he can comprehend it. "Don't stand back as a big man and look down on the little fellow and expect him to understand, for he won't do it," said Mr. Searby. As Mr. Schneider had already shown, other things besides the mere cutting of plants, description of organs, and so on, whereby systematic botany is taught, have been brought out in late years. Economic botany is of vast interest, and from it the student learns nearly everything that is valuable in botany. Just as soon as he begins to learn what the plant is, how it grows, what juices it contains and how formed, what are the uses of these juices in the drug store, in his fluidextracts, etc., and how they come to get them—in the dry form, of course—just that soon he begins to see that botany has something in it for him. The effort should be, with every teacher of botany, to show the utility of it, the value of it; so that, by and by, when the stu-

dent has gone further on and taken up his work in the drug store, he will know how to make a fluidextract or a tincture, or some other thing, and will understand the active principle involved. If he has knowledge of the constituent nature of plants, whatever it may be—its mucilages, its resins, its volatile oils—in relation to their volatility and other properties they may possess, the nature of other bodies met with in the course of manipulation, the student learns something, and he sees then that botany makes him a better pharmacist.

Mr. Remington said he was very much interested in Mr. Searby's remarks. He believed now, in all our educational institutions, there was more attention being given to a systematic study of botany than ever before, and he was very glad indeed to see it, for it was one of the foundation studies. In Philadelphia they have students who say the same thing in regard to the study of botany, that it is of no use in the drug-store; but they are coming to realize that it is. Under the influence of the Pure Food and Drugs Act, he thought there was no doubt but that microscopic tests would be given in the next issue of the Pharmacopœia, by which the pharmacist would be able to detect drug adulteration in many instances. This would be a very practical outcome of the increased interest now being taken in a knowledge of botany. Mr. Remington said he was also very much interested in what Mr. Searby had said about his old instructor in botany in England. He thought it would have done Mr. Searby's heart good if he could have seen what he saw there about twenty years ago. He had the privilege of witnessing an examination conducted before the Pharmaceutical Society of Great Britain, and he was sure that no State Board examination in this country put its young men through such a dose of botany as the examiners for Great Britain did. "Think of it!" said Mr. Remington, "of a lot of young men being brought forward for examination, having to stand about a table strewn with plants freshly taken from the earth, and being compelled to distinguish between dandelion, belladonna, digitalis, and the like—the real thing before them, not the customary dried specimens. That was a practical application of botany." He thought it would be a great thing for its educational value with the pharmacist to-day, if he were able to tell belladonna from a violet, say, when he sees it; and that he should be able to distinguish the mydriatic drugs, like belladonna from stramonium. He thought it would add greatly to the value of his education for the druggist to be able, when he saw a plant growing on the roadside, to realize that when properly selected and dried it was one of the remedies used in his store for the cure of disease; he thought it would be a great satisfaction to him.

Mr. Hallberg said there was one incidental valuable feature of a knowledge of botany that was of practical value to the pharmacist and the student of pharmacy—one which he confessed he had only become recently familiar with himself. This was the value of such knowledge in the inter-

pretation of prescriptions. For several years past, in the interpretation of prescriptions his students had sometimes found some substance which was entirely foreign, and in a number of instances the student who was familiar with botany would soon be able to tell what the particular thing was. He recalled one instance where "macrotin" was called for, and the boys did not know what it was. Finally one of the students said this was the same as "macrotys"—that macrotys was the old botanical name for it. He did not fail to point out to his students that this was a good illustration of a broad application of a knowledge of botany. Macrotin, Mr. Hallberg explained, was the eclectic resinoid or concentrations of cimicifuga, the "black cohosh" of the south—the ordinary black snakeroot.

Mr. Whelpley said the author of the paper had referred to botany as being the youngest of the natural sciences. We know it is one of the most interesting of the natural sciences, and one with which we become familiar on the easiest terms. That being true, it is but natural that our common schools and high schools give proportionately more attention to botany than they do to the other natural sciences, and the author of the paper very justly calls attention to the fact that the course of instruction in botany in our colleges of pharmacy should be regulated largely by the amount of knowledge the students have previously acquired in their common schooling. Until a few years ago botany was taught in the common schools and high schools very much as Mr. Searby had explained, in an off-hand manner. He was reminded of the answer of a young lady to his inquiry as to whether she studied botany: "Yes, I think that is it. It is the study of plants, is it not?" To-day in the schools, however, they are teaching botany very much as Mr. Remington explained they are doing in England. The teachers are growing the plants in their botanical gardens, and the course prepares the student who goes to the college of pharmacy to take up the subject in a more advanced stage and a more intelligent manner than formerly and to get more out of it than was ever the case before. Mr. Searby's account of how his class in London stood practically still for two months reminded him of the definition of biology given by one of his students, that "it was a study of the low forms of animal life," and then proceeded to fortify himself in this position by the claim that he had taken the prize at his school for excellence in biology, and he knew that all he had ever studied was about "worms and crawfish."

Mr. Wilbert said he was very glad indeed that Mr. Schneider had pointed out the need for a practical method of teaching botany, for there was probably no branch of the pharmacist's training that he forgets so readily as the mere smattering of natural science that he generally gets in his botany course—and that is because of the manner in which it is taught. He has not had the preliminary training to fit him for proper instruction along that line. It is unfortunate that the student can go out from the

schools of pharmacy and medicine having but a mere smattering of a knowledge of botany, which is soon forgotten from disuse. There are few branches taught in the pharmacy course that would be of more interest or value than the study of botany. Pharmacists generally would find use for it in a practical way. To have knowledge of what a plant is, what it is used for, and what its properties are, must be of deep interest to any pharmacist, and the practical application of such knowledge is most useful.

Mr. Flint thought this question of botany was one that all were interested in. When he was at the Philadelphia College, his instructor in botany—a man that all knew by reputation—took his class into the fields and lectured on botany out in the woods. This method was very interesting and instructive to the student, for he actually saw the plant growing, pulled it up and studied it in the field. He saw not only its growth, but acquired a knowledge of its constituents. Very few at the present time take the students into the field. In large cities, of course, it is hard to do this. In Philadelphia, at that time, they went into the parks and into the swamps, and got many interesting plants. He commended the idea of teaching botany in the schools, and even in the high schools. He also commended the use of the microscope, but expressed regret that so few were to be found in the drug-stores; he doubted whether a microscope could be found in one out of twenty stores in the land. If some means could be hit upon to stimulate the interest of pharmacists in this study it would be most desirable. It would be valuable for the identification of specimens that come to him from the wholesaler and the manufacturer, where there is liability to mistake.

Mr. Philip, of Fruitvale, Cal., thought there were very few students who were willing to continue their studies after graduation. They go into the stores to hard work, their good intentions slip by them, and they permit the iron that is so hot when they come out of college to cool off. Most boys when they leave college say I will do this and that, but there is not much the graduate can do. He said he thought the American Pharmaceutical Association, through its branches, ought to take up the great work of keeping in touch with these graduates so full of enthusiasm and willingness to do, and ever anxious to continue their studies, and stimulate them and encourage them to keep up their work, so they would not permit their knowledge to fall into disuse.

Mr. Kebler commended the practical feature of the work done by Mr. Schneider, and said his experience had been that if the student is impressed with the practical importance of the work he has to do in connection with his college work he will take a very much more lively interest in a given study and will be much more apt to follow it up. If the student is simply taken out into the field and told this is poke-root and that the leaves, that does not mean much to him. But tell him that the roots are

used to adulterate belladonna, and that the leaves are used to adulterate belladonna leaves, and then show him the next morning how they can be separated and the one distinguished from the other, and it is impressed upon him so that he will never forget it, and he is liable to follow it up.

The Chair stated that the next paper on the program was one by Virgil Coblentz, on "The Possible Therapeutic Value of Impurities in Official Chemicals and their Preparations," which the gentleman had written him several months ago he would send, but the paper had never been received.

Mr. Hallberg was then called on to read a paper on "The Professions of the Practicing Pharmacist." Mr. Hallberg gave the substance of his paper in full abstract, the text thereof being as follows:

THE PROFESSIONS OF THE PRACTICING PHARMACIST.

BY C. S. N. HALLBERG.

It is not our purpose to delve into the history of ancient pharmacy farther than to indicate the difficulties that have attended the progress of pharmacy to become independent as a practice and profession.

HISTORICAL.

From the earliest times the preparation and compounding of medicines—no less than their administration—has been the subject of much controversy, and the fate of those engaged therein, the object of trials, tribulations and vicissitudes.

Owing probably to the mysticism and superstition of the early art, more was demanded of those engaged in the practice than of those occupied in other pursuits.

Their relation to the public was peculiar and often confidential, and they had to take advantage of everything that would contribute to maintain their position and guard it against evil influences.

The following rules promulgated for the guidance of the practice of pharmacy by a prominent apothecary, a cousin of Queen Anne, in the sixteenth century in England illustrates this feature:

> The apothecary must first serve God; forsee the end, be cleanly, and pity the poor. His place of dwelling and shop must be cleanly, to please the senses withal. His garden must be at hand with plenty of herbs, seeds and roots. He must read Dioscorides. He must have his mortars, stills, pots, filters, glasses, boxes, clean and sweet. He must have two places in his shop: one most clean for physic and the base place for chirurgic stuff. He is neither to increase nor diminish the physician's prescription. He is neither to buy nor sell rotten drugs. He must be able to open well a vein, for to help pleurisy. He is to meddle only in

his own vocation, and to remember that his office is only to be the physician's cook.

In France at that time the apothecaries were compelled by the physicians to take the following oath :

ANCIENT APOTHECARY'S OATH.

I swear and promise before God, the Author and Creator of all things, One in Spirit and divided in Three Persons, eternally blessed, that I will observe strictly the following articles :

First. I promise to live and die in the Christian faith.

Second. To love and honor my parents to the utmost ; also, to honor, respect and render service, not only to the medical doctors who have imparted to me the precepts of pharmacy, but also to my teachers and masters from whom I have learned my trade.

Third. Not to slander any of my ancient teachers or masters, whoever they may be ; also, to do all I can for the honor, glory and majesty of physic.

Fourth. Never to teach to ungrateful persons or fools the secrets and mysteries of the trade ; never to do anything rashly without the advice of a physician, or from the sole desire of gain ; never to give any medicine or purge to invalids afflicted with acute disease without first consulting one of the faculty.

Fifth. Never to examine women privately, unless by great necessity, or to apply to them some necessary remedy ; never to divulge the secrets confided to me.

Sixth. Never to administer poisons, nor recommend their administration, even to our greatest enemies, nor to give drinks to produce abortion, without the advice of a physician ; also to execute accurately their prescriptions, without adding or diminishing anything contained in them, that they may in every respect be prepared "secundem artem."

Seventh. Never to use any succedaneum or substitute without the advice of others wiser than myself ; to disown and shun as a pestilence the scandalous and pernicious practices of quacks, empirics and alchymists, which exist to the great shame of the magistrates who tolerate them.

Lastly. To give aid and assistance indiscriminately to all who employ me, and to keep no stale or bad drug in my shop. May God continue to bless me so long as I continue to obey these things !

On the organization of the American Pharmaceutical Association in 1852, a code was proposed and afterward adopted, intended to regulate the practice of pharmacy and the conduct of its votaries.

CODE OF ETHICS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The American Pharmaceutical Association, composed of pharmacists and druggists throughout the United States, feeling a strong interest in the success and advancement of their profession in its practical and scientific relations, and also impressed with the belief that no amount of knowledge and skill will protect themselves and the public from the ill effects of an undue competition, and the temptation to gain at the expense of quality, unless they are upheld by high moral obligations in the path of duty, have subscribed to the following Code of Ethics for the government of their professional conduct.

Art. I. As the practice of pharmacy can only become uniform by an open and candid intercourse being kept up between apothecaries and druggists among themselves and each other, by the adoption of the National Pharmacopœia as a guide in the preparation of officinal medicines, by the discontinuance of secret formulæ and the practice arising from a quackish spirit, and by an encouragement of that esprit du corps which will prevent a resort to those disreputable practises arising out of an injurious and wicked competition;

Therefore, the members of this Association agree to uphold the use of the Pharmacopœia in their practice; to cultivate brotherly feeling among the members, and to discountenance quackery and dishonorable competition in their business.

Art. II. As labor should have its just reward, and as the skill, knowledge and responsiblity required in the practice of pharmacy are great, the remuneration of the pharmacist's services should be proportioned to these, rather than to the market value of the preparations vended. The rate of charges will necessarily vary with geographical position, municipal location, and other circumstances of a permanent character, but a resort to intentional and unnecessary reduction in the rate of charges among apothecaries, with a view of gaining at the expense of their brethren, is strongly denounced by this Association as productive of evil results.

Art. III. The first duty of the apothecary, after duly preparing himself for his profession, being to procure good drugs and preparations, (for without these his skill and knowledge are of small avail), he frequently has to rely on the good faith of the druggist for their selection.

Those druggists whose knowledge, skill and integrity enables them to conduct their business faithfully, should be encouraged, rather than those who base their claims of patronage on the cheapness of their articles solely.

When accidentally or otherwise, a deteriorated or adulterated drug or medicine is sent to the apothecary, he should invariably return it to the druggist, with a statements of its defects. What is too frequently considered as a mere error of trade on the part of the druggist, becomes a highly culpable act when encountered by the apothecary; hence, when repeti-

tions of such frauds occur, they should be exposed for the benefit of the profession.

A careful but firm pursuit of this course would render well-disposed druggists more careful, and deter the fraudulently-inclined from a resort to their disreputable practices.

Art. IV. As the practice of pharmacy is quite distinct from the practice of medicine, and has been found to flourish in proportion as its practitioners have confined their attention to its requirements; and as the conduction of the business of both professions by the same individual involves pecuniary temptations which are often not compatible with a conscientious discharge of duty; we consider that the members of this Association should discountenance all such professional amalgamation; and in conducting business at the counter, should avoid prescribing for diseases when practicable, referring applicants for medical advice to the physician.

We hold it as unprofessional and highly reprehensible for apothecaries to allow any percentage or commission to physicians on their prescriptions, as unjust to the public, and hurtful to the independence and self-respect of both the parties concerned. We also consider that the practice of some physicians, (in places where good apothecaries are numerous) of obtaining medicines at low prices from the latter, and selling them to their patients, is not only unjust and unprofessional, but deserving of the censure of all high-minded medical men.

Art. V. The important influence exerted on the practice of pharmacy by the large proportion of physicians who have resigned its duties and emoluments to the apothecary, are reasons why he should seek their favorable opinion and cultivate their friendship, by earnest endeavors to furnish their patients with pure and well prepared medicines. As physicians are liable to commit errors in writing their prescriptions, involving serious consequences to health and reputation if permitted to leave the shop, the apothecary should always, when he deems an error has been made, consult the physician before proceeding; yet in the delay which must necessarily occur it is his duty, when possible, to accomplish the interview without compromising the reputation of the physician. On the other hand, when apothecaries commit errors involving ill consequences, the physician, knowing the constant liability to error, should feel bound to screen them from undue censure, unless the result of a culpable negligence.

Art. VI. As we owe a debt of gratitude to our predecessors for the researches and observations which have so far advanced our scientific art, we hold that every apothecary and druggist is bound to contribute his mite toward the same fund, by noting the new idea and phenomena which may occur in the course of his business, and publishing them, when of sufficient consequence for the benefit of the profession.

In the following year the Association adopted a resolution defining its

position on the questions of Nostrums, which was followed next year (1854) with a report which shows how important this subject was then regarded more than half a century ago.

RESOLUTION ON NOSTRUMS.

"*Resolved*, That the American Pharmaceutical Association believe that the use and sale of secret or quack medicines is wrong in principle, and is in practice attended with injurious effects to both the profession and the public at large, and believe it to be the duty of every conscientious druggist to discourage their use.

"*Resolved*, That this Association earnestly recommend to our pharmaceutical brethren to discourage by every honorable means the use of these nostrums; to refrain from recommending them to their customers; not to use any means of bringing them into public notice; not to manufacture or to have manufactured any medicine the composition of which is not made public; and to use every opportunity of exposing the evils attending their use and the false means which are employed to induce their consumption."

THE REPORT OF THE COMMITTEE ON QUACK MEDICINES.

"The disposition to take what are called popular medicines, and a tendency to a belief in their utility, is a fact with which every observer must be familiar, and in view of this strong popular feeling your committee would suggest:

"First. That this desire for medicine can be gratified in a legitimate way by regular official preparations.

"Second. That it is the duty as well as to the interest of the apothecaries and druggists to advocate the use of the official medicines in lieu of the quackery of the day.

"Third. That it is the rightful interest of regular pharmacists to divert, in this manner, the thousands which now annually flow into the coffers of quacks, into their own limited stores, where of right it belongs.

"Fourth. That this can only be done by a united and sustained action on the part of the pharmacists and druggists of the Union, by which they will practically refrain from the sale or advocation of secret medicines, and substitute regular official compounds for them, correctly labeled, with name and directions for use.

"Fifth. That this course should receive the sanction of physicians as the only one likely to remedy the evils aimed at, as the tendency to take medicine *ad libitum* is a feature of the Anglo-Saxon race, duly inherited by the American people, which, whatever may be its faults, is as much their nature as is the love of political and personal freedom.

"With regard to the propriety and efficacy of legislative action, we think that movements in that direction should originate in the several states, and be the joint action of the medical and pharmaceutical professions, and when applications are made to legislatures they should be based on a real interest on the part of druggists, and apothecaries generally, to abate the evil, and not on a partial or very local movement."

The last report brings us up to the present and to the question uppermost at the present time. It, perhaps more than any other, may be said to represent the irrepressible conflict.

The correctness of the propositions advanced can scarce be challenged, and yet, after over half a century of experimentation, trials and tribulations, a start—and a meager start at that—has only recently been made in the Food and Drugs Act of 1906. That this act is only a start, in so far as it is designed to regulate the sale of patent medicines for the protection of the public, is realized by all who are in a position to judge and know whereof they speak. It is based on the principle that there are certain medical substances which are so potent that their use without the knowledge of the taker would be dangerous, or of other substances whose frequent or constant use unwittingly might produce drug habit or other serious consequence.

Of all these declarations there is, at the present time, nothing left at least as far as the A. Ph. A. is concerned.

Some of the older societies and a few state associations yet retain a Code of Ethics, they are for the most part "dead letters," or at least "more honored in the breach than in the observance."

Even the American Medical Association has abandoned the "Code" for "The Principles of Ethics," in which are retained only the following brief paragraphs relating to pharmaceutical interests.

PATENTS AND SECRET NOSTRUMS.

Sec. 8. It is equally derogatory to professional character for physicans to hold patents for any surgical instruments or medicines; to accept rebates on prescriptions or surgical appliances; to assist unqualified persons to evade legal restrictions governing the practice of medicine; or to dispense, or promote the use of, secret medicines, for if such nostrums are of real efficacy, any concealment regarding them is inconsistent with beneficence and professional liberality, and if mystery alone gives them public notoriety, such craft implies either disgraceful ignorance or fraudulent avarice. It is highly reprehensible for physicians to give certificates attesting the efficacy of secret medicines or other substances used therapeutically.

RELATIONS TO PHARMACISTS.

Sec. 5. It is the duty of physicians to recognize and by legitimate patronage to promote the profession of pharmacy, on the skill and proficiency of which depends the reliability of remedies, but any pharmacist who, although educated in his own profession, is not a qualified physician, and who assumes to prescribe for the sick, ought not to receive such countenance and support. Any druggist or pharmacist who dispenses deteriorated or sophisticated drugs, or who substitutes one remedy for another

designated in a prescription ought thereby to forfeit the recognition and influence of physicians.

Owing to the extended and generally desired efforts to restore the relations of the pharmacists to the physicians, believed to be essential to the progress of the reform in Materia Medica and Therapeutics, which has been proceeding for several years, through the work of the American Pharmaceutical Association and the American Medical Association, in conjunction with the work of the Council of Pharmacy and Chemistry, it is believed that some agreement should be reached with reference to at least some of the most important questions invoked in this sometime appearing, conflicting interests.

These resolve themselves into the three following propositions:

1. The attitude to the prescription.
2. The prescribing by druggists.
3. The dispensing by doctors.

The following has been adopted tentatively by a number of Branches of the A. Ph. A.

DECLARATION ON THE PRESCRIPTION.

Adopted by the New York Branch.

"(1) The prescription should be a signed and dated order from the physician to the pharmacist to prepare and deliver certain medicines, etc., to the patient. The prescription should be written plainly and distinctly in ink, if possible, and should bear the full name of the prescriber, either printed or written, and should state the name of the patient and also the age, if a child.

"A telephoned prescription, that is, a prescription which, in case of an emergency, the physician telephones to the pharmacist, must in all cases be repeated by the pharmacist, so as to avoid misunderstanding and should be followed, especially in the case of potent drugs, with a written order from the doctor. In case the physician intends to prescribe an unusually large dose, the quantity of drug should be underlined and be followed by an exclamation mark (!). General directions such as 'As directed,' etc., should not be used.

"(2) The pharmacist who dispenses the medicine should invariably retain the original prescription for future reference, and as a record for a limited period—say five years. This is for his own protection as well as for that of the prescriber and the patient.

"(3) The medicine prescribed should not be supplied more than once on the same prescription in the following instances: (a) If ordered by the prescriber 'not to be repeated' or marked Ne 'repetatur'; (b) If it contains medicinal substances commonly called narcotic or habit-forming drugs; (c) If asked for by some person known not to be the original holder.

"(4) One copy of the prescription may be furnished to the patient, but to no other person. This copy should be marked 'copy' or 'copies' and should be plainly and distinctly written in ink. In the event of the prescriber not desiring a copy to be given, he should note this on the prescription by writing the words: 'Give no copy.' We believe it to be desirable that such notation should be made on every prescription. Under no circumstances should a copy of the prescription be given after the patient has recovered, without the consent of the physician."

When this declaration or something like it would once be generally adopted an entering wedge would be secured for the correction of other abuses. The other two propositions must be solved if at all by mutual conferences, conventions and compromises.

In view of the exceeding great importance of the entire question this subject is referred to the Branches for further consideration and eventually for conventions by the medical societies in their respective localities.

Chicago, August 1, 1909.

The Chair invited Mr. Eberle to present a paper he had prepared on the subject of label requirements in state pure-food laws. Mr. Eberle explained that this paper was brought forth by a decision of the Attorney General of Texas just a few days before he left home. Under their pure food law they had obtained an opinion from the Attorney General that it was not necessary to state the alcoholic content upon a prescription calling for a U. S. P. preparation, but recently the food commissioner, who had concurred in this view when the law was first passed, had asked for a ruling of the Attorney General's department again, and they reversed their first ruling, making it now compulsory to place the alcoholic content on tinctures and so on sold over the counter, and not only this, but according to his ruling the placing of the alcoholic and other contents on the prescription label. This change of position caused him to write the paper more to get an expression from the members than anything else. Mr. Eberle then read his paper:

LABEL REQUIREMENT IN STATE PURE FOOD AND DRUG LAWS.

BY E. G. EBERLE.

Quite a number of states require that the amount of alcohol content be stated on the label regardless whether the preparation is one of the Pharmacopœia or National Formulary or not. The same applies to drugs that will habituate. The latter are few in number, and as a precaution it is best to indicate these, for the conscientious pharmacist is desirous of discouraging the general use of such preparations. For these reasons no objection is made to such requirement, but this argument does not obtain with alcohol, which is in the preparation only for its solvent and preservative action.

The states having these demands in their laws recognize the Pharmacopœia and National Formulary as standards. It is therefore to be assumed that a preparation is misbranded if not in conformity with the prescribed strength, which of course includes alcohol content. Under these conditions we fail to see the reason for the law to say that a drug is misbranded if, when sold under or by a name, recognized in the eighth decennial revision of the United States Pharmacopœia, or in such United States Pharmacopœia as was official at the time of labeling it, or in the National Formulary, it differs from the standard strength, quality or purity laid down therein; if, when sold under or by a name not recognized in the eighth decennial revision of the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on materia medica, it differs materially from the standard of strength, quality or purity laid down in such work.

We believe that it belittles the authority of the standards and gives rise to the manufacture of pharmaceuticals of inferior strength, of variations, all of which we try to avoid by having legal standards. It ought to be our continual endeavor to establish uniformity of product, and by that is not meant that in the interim of revision some one could not improve upon these preparations, but as a general proposition. The label cost is to some extent a tax, at least an expense, although not a very large one, and is necessitated with every change of the Pharmacopœia. The required statement is an assertion which is intended to give emphasis to that which ought to mean all it says, namely, made of the strength required by the official standards. For example, Tincture of Ferric Chloride ought to mean all that is said in the definition, and it should not be necessary to go over this again and refer to the alcoholic content, as if this were the main constituent or that the name did not imply its composition.

If the assumption is correct, State laws should specifically exempt pharmacopœial and National Formulary preparations and prescriptions from this provision of the law, so as to avoid misunderstanding of the law and to impress what an official standard means.

In Texas the Attorney General ruled that the labeling of alcohol content was unnecessary, and last year the present commissioner agreed with him. This year in a recent ruling he has apparently changed his views and disagrees with the ruling of the Attorney-General's Department. Such conditions bring about confusion, discontent and antagonism to the law.

The writer believes this matter of sufficient importance for this Section to discuss and to give expression in accordance with the conclusions.

Continuing, Mr. Eberle said he did not know what the law was in most of the States, whether they exempted pharmacopœial preparations or not. In his State the Attorney-General first ruled that they were exempt, and now he had ruled the other way, and it led to confusion.

The Chair invited discussion on the paper, and Mr. Asher said he could

answer Mr. Eberle in regard to the situation in Louisiana; that when the Louisiana pure food and drugs act was drawn up, this vexatious question was commented on and discussed quite fully, and it was finally decided that N. F. and U. S. P. preparations did not need the alcoholic and opium content to be expressed. The name itself implied what it was, and that it conformed to the official standard.

Mr. Kebler remarked that the Louisiana law was quite different from the laws of other States. He could answer the question so far as the Federal law was concerned with very little trouble. He did not know what had transpired in some of the State legislatures, but was conversant with what had transpired at Washington. When the bill was introduced, and had passed both houses, both the Senate and House of Representatives, there was a clause in it which exempted both U. S. P. and N. F. products, on the same idea as that presented here this afternoon. But in discussing the two bills it was pointed out on the floor of the House that it was absolutely improper to exempt any product, as to do so would be a discrimination, and could be taken as a basis for declaring the law unconstitutional. For that reason, that feature was entirely eliminated, as bearing on U. S. P. and N. F. preparations and physicians' prescriptions. They had always held that U. S. P. and N. F. preparations just as much required the alcoholic and morphine content to be stated on the label as any proprietary remedy.

Mr. Asher asked Mr. Kebler if he understood him to say that the objection was, that it might be construed as class legislation, and he replied in the affirmative.

The Chair called for a paper on itinerant vending, by Mr. Eberle, and that gentleman presented his subject as follows:

Mr. Eberle stated that this subject might be, to some extent, one of local interest only, but he understood itinerant vending was carried on very extensively throughout the Central States—at least the National Association of Retail Druggists had framed a model law to deal with this question. They had had experience with this evil in Texas, and had been successful in procuring the passage of a law imposing a tax of $100 a month on these parties. He then read his paper.

THE ITINERANT VENDING OF MEDICINES.

BY E. G. EBERLE.

The itinerant method of vending medicines in some sections of the country has grown to large proportions. The harmfulness of such methods can well be compared with the effect of false and misleading statements on a package or in advertisements. The medicines are not sold directly, but left in the homes to await the occasion suggesting their use at intervals. The distributor, with an intelligence which is supposed to equal

that of the physician and pharmacist, extols the virtues of the remedies. The extent to which this method of selling has obtained has cut quite heavily into the annual sales of druggists in the community where such trade is carried on. It more particularly affects those who sell largely to farmers, but city trade is not free. At first the articles sold were chiefly "patent" medicines, but now the more common household remedies, spices, perfumes, etc., have been added. Doubtless there are some here who have been affected by such trade and who would be glad to have information and suggestion from those who have had experience as to how this method of selling can be done away with or how to frame an acceptable law.

The larger firms following this method of doing business distribute their goods through persons known in their respective communities. They have learned through experience that most legislators are influenced by the wishes of their constituents, and in an agricultural state by the farmers, to whom, as stated, most of these products are sold. As soon as these men enter a territory they secure signatures, which they use before the Legislature when occasion demands. When the druggists appeared before the Texas Legislature—and similar experiences are reported from elsewhere—the representatives of these firms, during the argument, presented thousands of these signatures purporting to request—if not in reality—their representatives to fight any measure in antagonism of these interests, and this won the battle here, as also in other states. I am reliably informed that in one state, which is represented here, some of the signers of a petition of this kind had been dead for quite a number of years. This simply shows what unfair means are resorted to in obtaining these signatures. There are two methods of control that present themselves: one taxation and the other preventing house-to-house selling of medicines. Taxation suggests that the plan of distribution is not wrong, but that the venders should contribute to the support of city, county and state. In order to secure legislation which is simply a tax-measure, argument of the danger in the method cannot be presented; the other method practically precludes the suggestion for a prohibitive tax, but permits of the better reasoning that such indiscriminate selling of drugs and medicines endanger public health. A legislature will hardly pass a tax measure which really prohibits the carrying on of the business to be taxed.

While we may not be pleased with the portion of business that concerns the sale of "patent medicines" it is part of present day drug stock and must have consideration. It is a matter of impossibility to prevent their sale if made in conformity to the laws, but in the writer's opinion indiscriminate sale of which house to house peddling is one of the worst types can be stopped. This ought to be the purpose and aim in asking for legislation, not by taxing the business out of existence but submitting the proposition on its merits. The peddling of harmless arti-

cles of merchandise has been successfully prohibited by legislation, why not peddling of medicines which, if misused, unquestionably does serious injury?

The Chair stated that if there were no remarks on the paper it would take the usual course, and it was so ordered.

The Chair called attention to the fact that, at the morning session, he had been directed to appoint a committee of five to take into consideration Dr. Hamilton Wright's paper on opium and his proposed law on the subject, and he would name the following as composing this committee: William Jay Schieffelin, of New York City, Chairman; M. N. Kline, of Philadelphia; Henry P. Hynson, of Baltimore; Chas. M. Ford, of Denver, and K. B. Bowerman, of San Francisco.

As a committee of three on the resolutions offered by Mr. Lichthardt, of Sacramento, upon the illegitimate use of Cannabis Indica, the Chair appointed the following: E. G. Eberle, of Dallas, George F. Payne, of Atlanta, and L. A. Seltzer, of Detroit.

The Chair said if there was no further business before the Section, a motion to adjourn would be in order. It was so moved, and the Section stood adjourned to 8 p. m. this (Wednesday) evening.

THIRD SESSION—THURSDAY EVENING, AUGUST 19, 1909.

The third session of the Section on Education and Legislation was held jointly with the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, at the Hotel Alexandria, on Thursday evening, at 7:30 o'clock. This session was to have been held, according to the published program at the Virginia Hotel, at Long Beach, on the Pacific Ocean, twenty miles from Los Angeles, on Wednesday evening, but had to be postponed on account of the impossibility of getting a suitable room in which to meet, because of the crowded condition of the hotel.

Chairman England, of the Committee on Education and Legislation, presided over the joint meeting, and stated that several matters were to be considered, at this session among them a paper by Mr. Schneider entitled "Our Educational System and Our National Forces," brought over from the last session, but this would be held over for the time being, on account of the absence of the writer.

The Chair said the next order of business was the report of the Syllabus Committee, referred to this session by the Association of Boards of Pharmacy. He asked if any one present had that report.

Mr. Ernst G. Engstrom said he was a member of the Syllabus Committee, and had a report which concerned the New England Branch of the National Association of Boards of Pharmacy, but that it was expected that

Mr. J. H. Beal would hand in the general report to the conference last night; whether he had or not he did not know. So far as the detail work of the Syllabus Committee was concerned, he did not believe it would be feasible to go into that here, as the report made a document of some 118 pages.

Responding to the suggestion of Mr. Engstrom, Mr. Asher said Mr. Beal had read his report before the Conference, and had reported progress.

The Chair stated that this explanation would suffice, and that the next matter to be considered was a communication from Mr. H. E. Kalusowski, of Washington, D. C.. in the hands of Mr. Engstrom.

Mr. Engstrom said he had received a communication from Mr. H. E. Kalusowski, of Washington, D. C., asking him to present the outline, at least, of some views he had reduced to writing upon the work and opportunity of the Conference of Pharmaceutical Faculties. In the first place, he said, Mr. Kalusowski asks the question, "Has the past of the Conference measured up to the expectations that were raised when it came into existence?" and his reply to that question is:

"Viewed from the standpoint of membership the answer is negative; viewed from the point of raising standards in the curricula of pharmaceutical schools the answer is affirmative, though the results may not be satisfactory to those who feel some impatience with the rate of progress to the present time."

Then he refers to the fact of the adoption of more than one standard. In other words, he claims that in certain sections of the country the standard is not as high as it is in other sections—which is all described in his paper.

And still he says, "We must stick to the main subject, and furnish a maximum and minimum"; and then he goes on to say:

"The Kansas City resolution fixing a minimum standard of 1100 hours instruction nearly equally divided into lectures and laboratory work is a reasonable allowance of time in which a knowledge of the fundamentals of pharmacy can be systematically instructed. It would be well to adopt some general plan for a syllabus of subjects that would serve as a basis."

"As a matter of fact," said Mr. Engstrom, "the gentleman is not familiar with the work the Syllabus Committee is doing along this line."

"As a basis for instruction, by stating how much and what subjects in each of the branches, Pharmacy, Materia Medica and Chemistry should receive all the attention possible in the time named, this point seems weighty when it is considered that the standing and reputation of schools of pharmacy is almost invariably determined upon how well they meet the demands made by pharmacists for efficient and capable assistants, some of the announcements from a respectable number of schools of pharmacy appear and read more like preparatory schools for entrance into medical schools than for the purpose of training assistants in pharmacy. The un-

derlying educational idea that survives in them being that long-exploded one, that every doctor of medicine was qualified to become on a moment's notice a competent pharmacist. It is a poor rule that won't work both ways, it needs no argument to show how poor is the rule in this case, the practice of medicine is as sharply differentiated from the practice of pharmacy as the art of surgery is from the "tonsorial parlor"; the only point in common with medicine and pharmacy is that of a preliminary liberal education."

Mr. Engstrom said he would leave out the "liberal" and say "preliminary," because it is hardly a "liberal" education as yet. He reminded the members that the Boards of Pharmacy had no longer ago than yesterday adopted a resolution, based on a recommendation of retiring President Lillie, that the effort shall be to gradually raise the standard of examination, until there shall eventually be demanded a high school education or a college diploma.

"It is essential that the Conference should sustain and encourage to the highest possible degree of efficiency those educational qualifications upon which State Boards will determine the fitness of their graduates.

"State Boards cannot go outside of the legal restrictions set upon them by the statutes."

That is, they cannot go on and demand a college diploma if the statute does not say they have to.

"But their efficiency can always be increased, and it is possible for the Conference, without exceeding its sphere of action, solely by the quality of its educational work, to exert such influence that will be felt by the Boards of Pharmacy, and their response will be in improved and more thorough methods of examination."

"Exactly what we are doing to-day, gentlemen," said Mr. Engstrom.

"Its scope, this is clearly defined in the resolutions adopted at Kansas City, a gradual broadening of pharmaceutical curricula that should keep pace with the advance and progress in those sciences that form the foundation of pharmacy. Due consideration should be paid to methods of teaching certain essential subjects in order that the students would know how to think correctly at the right time."

Then he further goes on to say that the Conference should lend its aid and encouragement to the schools which, while deficient, show a disposition to raise their standards to the minimum required, should consider well how best to deal with the problem of schools whose sole aim is to prepare students by a superficial method of cramming for State Board examinations, should be careful in the attempt to control its membership by way of legislation, etc., and winds up by expressing the hope that the Boards of Pharmacy and the Conference of Faculties will act together for the improvement of the educational standard.

Chairman England stated that the hour had now expired in which they

were allowed the use of the room in which the session was being held, which was now to be devoted to another purpose, but that Mr. Schneider's paper on the subject of "Our Educational System and Our National Forces," had not yet been presented, and he would ask the author to do so. Mr. Schneider then read the following:

OUR EDUCATIONAL SYSTEM AND OUR NATIONAL FORCES.

BY ALBERT SCHNEIDER.

The following brief summary of a very large subject was prompted by the oft-recurrent discussion anent pharmaceutical education and pharmaceutical degrees. This entire discussion has thus far produced little, if any, results, but it has brought to light some remarkable inconsistencies and incongruities in argument, largely due to the fact that little attention was given to the fundamentals involved. These fundamentals are touched upon in this paper, which is intended as the basis for possible further discussion.

Educators have from time to time called attention to certain defects and inconsistencies in our educational methods. Particularly severe have been the criticisms of the high school system which is declared to be somewhat impractical and is said to fail in serving as a suitable feeder for the universities. Our university system has been declared defective, partly because it apparently falls below the European standard. It shall be the object of this paper to discuss very briefly the more flagrant defects in our educational system and present a brief outline of what is perhaps a more equable adjustment of the status of the educational qualifications of the several professions.

Education is simply a matter of development, not an acquisition nor an addition. It would be more appropriate to say we develop the power of knowing than to say we acquire knowledge. At birth the individual is in possession of all the nerve cells, all the muscle elements that he will ever have. In life these cells and elements grow in size and develop in functional activity, but not a single new cell or element is added. If certain groups of brain cells are wanting at the time of birth, no amount of training, dieting, feeding or exercising can cause them to be generated. It is true that by exercise and training other cells which are functionally more or less closely related can supplant or correct to a greater or lesser degree such defect. However, no amount of practice and effort will enable the blind to see or the deaf to hear. An idiot remains an idiot, no matter how carefully he may be tutored. It is also a fact that through neglect or misuse, certain nerve cells which were present at birth, may become functionally stunted or they may die. If they are merely stunted, good care and proper exercise will develop and strengthen them again. If they are dead, no amount of effort will restore them. They are forever lost and with them the corresponding functional activity. We should take an

inventory of inheritance at birth and let this serve as the guide in applying the proper developmental training and educational influences. We must do the best we can with the material at hand. It is futile to attempt to create a functional activity for which there is no material basis. It is wrong to make life miserable for the child in attempting to teach it classical music when it is perhaps tone-deaf. It is a mistake to conclude that the boy is going to the bowwows because he is slow in number or has a poor memory for dates and names. The child has very likely inherited this peculiarity from its parents and in time will no doubt develop into a man almost as perfect as the father. These few assertions must suffice as space will not permit entering into a discussion of the relative importance of heredity and training in forming and developing the character of the individual. Only this much may be added. Education and training do not unfix the natural inheritance of the individual. Unfortunately this scientifically established fact is not generally accepted by the majority of educators. Much useless educational effort could be avoided if the truthfulness of this were more universally known.

This is a realistic, non-poetical age, and the indications are that the materialistically practical and the altruistically utilitarian will be the tendency in the time to come. Therefore our entire educational system from the kindergarten up, should have a tendency to develop useful, practical, altruistic men and women; not dreamers, idealists, schemers and fanatics. The educational system should tend to develop the best human instincts and powers to the highest degree.

An education should not be considered as a mere measure of mental superiority or as a means to gain distinction, power or wealth. Some appear to consider education as a systematized mind-feasting, a gorging, as it were, of the intellectual faculties, a sort of mental gymnastics. The one exhibiting the greater pyrotechnical display of isolated or aggregated educationally acquired data is too generally looked upon as the intellectually superior. An education should develop the powers of self-help and of help to others. The one who cannot help himself certainly cannot help others.

We are close to nature and the indications are that we will never be able to separate ourselves from mother earth and project ourselves into astral space. It would seem as though we must get our inspiration to live and to act from nature. Nature is real, however much we may be inclined to dream and idealize. Most of our educators have largely lost sight of "the man with the hoe," and are fixing their gaze upon "the king of the golden river."

A reform to be practical must not be extreme. In other words, a reform must not be revolutionary. It is true a revolution may work a change for the better, but more generally it means a swing to an opposite extreme, which is usually worse than the conditions which caused the revolution. A practical reform must seek to adapt the proposed change to the existing

conditions. The existing conditions are the product of past activities and past convictions, and an attempt to revolutionize such convictions would simply cause confusion and result in disaster. With these introductory remarks we shall now consider our present educational system and suggest the practically desirable reform measures.

1. *Kindergarten.*—This essentially foreign (German) branch of our educational system has evidently come to stay. There are some objections to the kindergarten on the ground that the young child should be taught at home by its parents. The father and mother should know the child's inheritance and should know best how to start the first mental efforts. This should be the case, but the sad fact exists that comparatively few parents seem to comprehend the mental peculiarities of their own child, and how it should be developed. Also, it is a fact that there are parents who cannot take the time to educate their young children. We may declare that such parents have no right to have children. True again, but they have children, and these children have a just claim to a proper mental training, development and discipline. There is therefore a place for the kindergartens, and they are doing excellent work. Children under six years should be very carefully instructed. There should be no attempt at force, no cramming or crowding of the young mind. The child should be permitted to take the initiative, and the teacher should know in which direction the mind should be led, developed and moulded. Children should not be worried, annoyed, scolded or subjected to physical punishment. Explain everything carefully and repeatedly, and do not get discouraged, remember how slow, dull, stubborn and vicious you yourself were, as a child, in the estimation of your teachers. Interest the young mind in the right direction, and make sure of the absence of deception and of evasive answers and poor logic. The child mind is very impressive, very receptive and very quick. You may deceive an adult, but you cannot deceive a young child very readily. The child observes and notes much more than the average adult wots of.

Give young children object lessons, verbal and pictorial, on a great variety of topics. Teach them nature observation; let them observe and examine plants, bugs and higher animals. Let them dig in the sand and dirt. Do not attempt to make them investigate, but be with them to watch over them and to assist and direct their spontaneous efforts. They should have a little practice in reading, writing, number work, in music, drawing, a little work for hands and feet, as much as possible in the form of games and play. No attempt should be made to unify and systematize kindergarten instruction. In brief, the chief aim should be to develop the child's powers of observation, to instruct it interestingly, to develop the mind slowly and carefully by a process of guiding and leading, not by driving and forcing. Let them live, observe and enjoy.

2. *Grammar School.*—The grammar school instruction begins at the

age of six years and ends at fourteen, on an average. This makes a period of eight years devoted to what is usually designated as common or grammar school work. The most serious defect in the grammar school instruction is the neglect of nature study. This very important, if not all important, subject barely receives recognition in many schools, a defect which is largely due to the printing-press, our easy book-making and ready access to books. As the result of the wide dissemination of the educational books, the opinion has gained credence among parents and teachers that nearly all worthy knowledge is to be obtained from text-books. This is a most deplorable mistake. As the result of such belief we have the sad spectacle of men and women, university graduates and some eminent teachers not excluded, who have no accurate knowledge of the simplest, most common objects met with in every-day life. Students from the larger cities enter upon university work wholly ignorant of the nature and origin of such common food-materials as peas, beans, corn, potatoes and flour. They have no clear idea as to the origin and composition of paper, of cloth, of water, of clouds, of dew, etc. They have never watched a seed germinate, they have never observed a new leaf develop, and have no true knowledge of the origin of cultivated plants and domestic animals. One university graduate and editor of a scientific journal did not know whether to class the potato as vegetable, seed or fruit. Such conditions of affairs indicate that there is something radically wrong in our educational methods. There is a crying need for nature study and observation in our schools.

Another serious defect in our grammar school system is the utter lack of systematic guidance in making visual observations, of visualizing properly. We do not get into the habit of looking at things with seeing eyes. Our visualizing does not induce an accurate mental impress and the visual stimulus is too transitory. In fact, the inability to visualize objects properly is due primarily to the neglect in nature study. The following questions will serve to make clear what is meant by the two educational defects referred to:

1. Are the hour numerals on the face of your watch Arabic or Roman?

2. Does the face of your watch show the minute marks and are these minute marks indicated by numbers? What are the numbers?

3. Can you state definitely the position of the second hand of your watch? Is it near the top, bottom, to right or to the left on the face?

4. How many toes has a dog on his front feet? How many on his hind feet?

5. Did you ever see a white colt? Or, were white horses originally white colts?

6. Does the horse swallow the last mouthful of water when drinking?

7. Have the sleeves of your coat buttons? If so, how many? Describe the buttons.

8. How many toes has a cow?

9. How does the germination and growth of seedlings of the pea and bean differ?

10. What is the apparent diameter of the moon as it appears above the horizon?

11. How many windows in the living room of your home?

12. How many gas jets or electric lights in your home?

An attempt to answer the above questions will make it quite clear that nature study and our powers of observation have been neglected. These defects should be suitably corrected in our grammar schools.

3. *High Schools.*—The high school is usually considered a feeder for the university. For some time American educators have endeavored to raise the high school curriculum so as to do away with the freshmen and sophomore years in the university. In other words, the American high school is to take the place of the gymnasium of Germany and of other European countries. Without entering into the pros and cons of this plan it is suggested that two high school courses be established, a junior course of four years and a senior course of six years. The former to serve as the necessary preparation for those who intend to teach the grammar grades and as a necessary preliminary or entrance preparation for college courses in dentistry, pharmacy and business, as indicated in table I. The senior high school course should be adapted to the preliminary requirement for courses in statesmanship, law, medicine and for those who intend to teach in high schools, universities and colleges. Such an arrangement would relieve the university proper and the professional schools and colleges from doing any preparatory work. Their entire time and attention could then be devoted to their respective special work.

It is intended that the first four years of the senior high school course should be the same as the junior course and that no specialization should be permitted in either course. The high school education should be preparatory, giving a good general educational foundation. Nature study should be continued in the high school, especially in the first, second and third year. Of course this nature study must be suitably adapted to the advance in age and experience of the students.

4. *Universities and Colleges.*—Having completed the high school course (either junior or senior) the student should desist from purely school work for one year. This does not mean that he should be idle. He should have an opportunity to think over the educational ground covered, to make observations, to make careful inquiries as to the intended future course. Is he adapted, by nature and inheritance, to take up the chosen calling? He should have time to weigh things carefully and to come to a definite conclusion. This year would correspond somewhat to the "Wanderjahr" of the European apprentice.

The university should be devoted very largely, if not entirely, to special-

ization, to the special educational requirements of the teacher, the investigators along all lines, to those who intend to follow literary pursuits. Thus the university would become more limited in its scope than it is at present, since the professions are to be taught in special colleges. The colleges or special professional schools, in order to meet the requirements, must be entirely distinct from the university as above limited. In fact the university would simply take the rank of a professional school or college.

After having completed a professional course in one of the special colleges, some time (one to two years) should be devoted to special experience. For example, the physician should have two years of experience in a hospital, at home or abroad. The statesman should visit other countries and study foreign customs, laws and methods of statescraft. The pharmacist should have one year of experience in some dispensary. The business man should observe methods of barter and exchange at home and abroad. The experience would give the finishing touches to the educational career, and would better prepare for the actual performance of duties pertaining to the chosen calling.

In conclusion it is desired to call attention to the relative importance of the several factors or callings, or rather forces, which are concerned in determining the status and progress of the nation. It is not a simple matter to formulate such a statement, and any classification that might be submitted would no doubt be subject to criticism.

Progress, individual, communal and national, is slow. It is asserted that it takes four generations to make a gentleman. It takes four to six centuries to make a nation. Progression or retrogression, individual as well as national, is the resultant of two forces, the one positive or for good, and the other negative or for evil. If the good predominates there is progress; if the evil predominates there is retrogression. If the good done by an individual during his lifetime predominated the world has been benefited by his having lived, if the evil predominated then he has been a hindrance to progress. This statement also applies to the several national forces and to the several nations relative to each other. Nations rise and fall, but it is believed that the rise is always higher than the fall, so that the general resultant represents progress. There are indeed dyspeptic pessimists who argue that the world is growing worse, but this is not the belief of the majority.

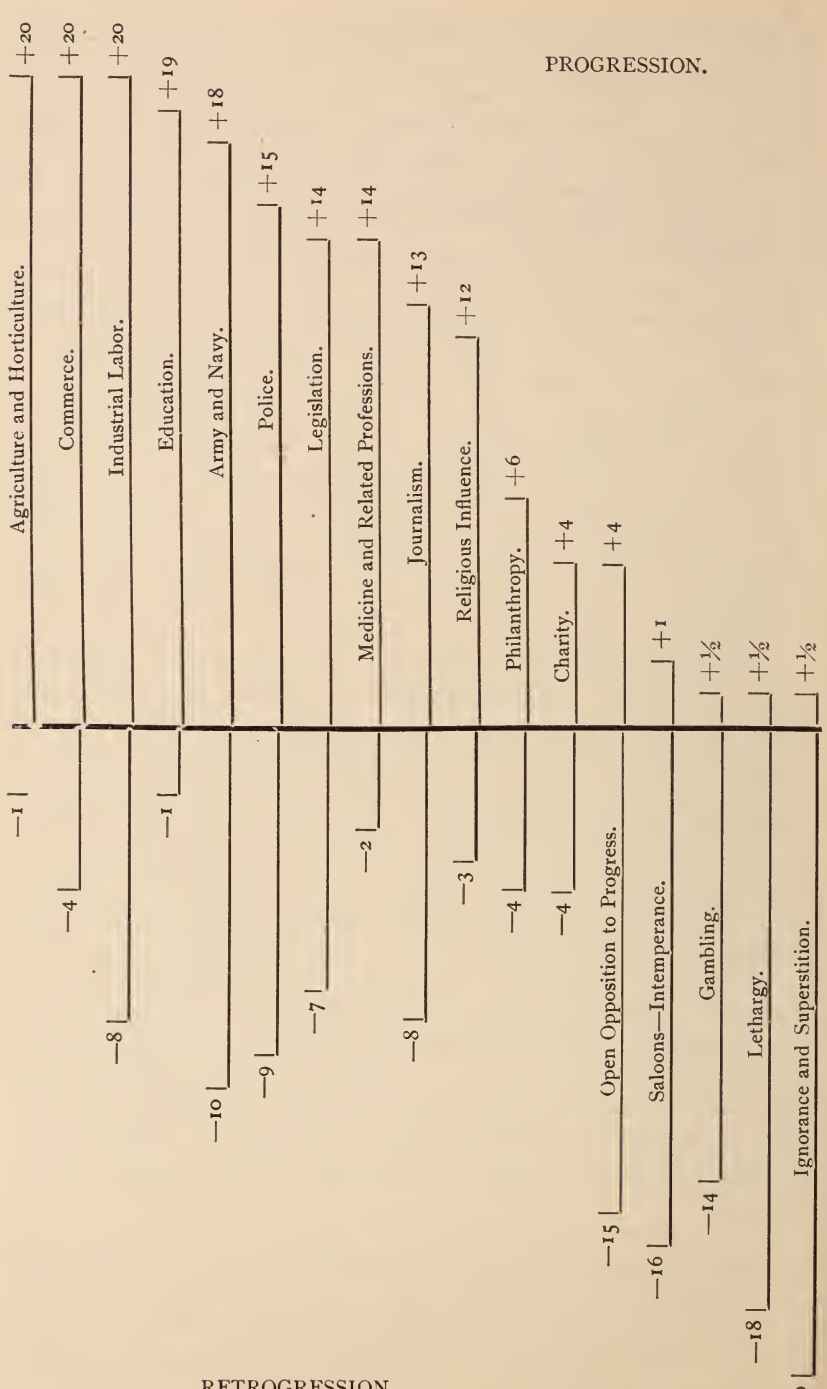
The following tabulation is intended to represent the influence for good and for evil of the several important national forces or factors, grouped as follows: 1. Agriculture and horticulture, including all operations pertaining to the productive tillage of the soil; 2. Commerce, including all operations pertaining to barter and exchange, wholesale and retail, transportation, shipment of supplies; 3. Industrial labor, including all operations in constructive work as building of houses, bridges, railroads, ships, etc.,

including both capital and labor involved; 4. Education, including all specialized efforts to improve the mind, as the work of teachers, tutors, professors and self-improvement of the mind; 5. Army and Navy as factors concerned in maintaining the integrity of the nation; 6. Police as the factors concerned in maintaining the integrity of the community, protection of the individual and of property; 7. Legislation, or the national and state law-making forces, however, not including the enforcement of law, as that comes under 5 and 6; 8. Medicine and related professions (pharmacy, dentistry, nurses) as the factors which maintain the public and individual health and sanitation; 9. Journalism, including the influence of newspapers and periodicals. While this is essentially educational in influence, it is clearly a factor by itself; 10. Religious teaching as representing the influence of the ministry and the church; 11. Philanthropy, as represented by spontaneous or voluntary gifts for the general betterment of society; 12. Charity as representing monetary donations to ameliorate poverty, to beggars, tramps and the "indigent poor," etc.; 13. Open opposition to progress; 14. Saloons; 15. Gambling: 16. Ignorance and superstition; 17. Lethargy and indifference. The accompanying table explains itself. Each national factor is represented by a certain number of + and — units. The—units represent the retrogressive or objectionable influence of the factor concerned. To explain, the army has + 18 and — 10 units. The — units indicate the nonproductiveness and drain upon the nations's resources of the military. The — 8 of industrial labor represents the destructive time-consuming and energy-wasting labor strikes and the unfairness of trusts and labor unions. It is a debatable question whether charity does any good. Philanthropy undoubtedly does more good than harm. The good done by saloons and by gambling is too infinitesimal to be worthy of recognition. The — 3 units of religious teachings and influence represents narrow dogmatic creeds and the checking influence on intellectual development. The — 8 of journalism represents the yellow variety and the pernicious influence of our large daily newspapers, etc., etc. It will be seen that the balance of units is +, thus indicating national progress, which may be represented algebraically thus, $g - e = + p$, in which g represents the good influence, e the evil influence and p the progress. Thus a balance of influence may also be determined for each individual factor. To illustrate, — 8 of journalism neutralizes 8 of the + units, leaving only a balance of 5 units in favor of progress. Charity leaves no balance, thus this factor may be left out of the reckoning. Army, navy and police are usually considered necessary evils. If industrial labor does not conduct itself more rationally it may also become a necessary evil instead of an unquestioned power for good. Saloons and gambling constitute unmitigated evils as they show a very large — balance. In every nation we find more or less opposition to certain movements which are for progress. Thus we find, for example, opposition

to the construction of a new railroad, new ships, a new school or college, etc. We find open opposition to vaccination and other sanitary measures, to new improvements in machinery, etc., etc. This opposition undoubtedly does more harm than good, although it does some good in preventing certain reform measures from running riot. Often opposition is far less retarding in its influence than ignorance and superstition which are the greatest progress-hindering difficulties to overcome. In some instances this ignorance and superstition may be more or less enforced as in portions of Russia and Spain, or it may be the result of pernicious social customs and laws and to pernicious or non-progressive religious doctrines. Lethargy or indifference simply acts as a dead weight to progress. If lethargy is the dominating national factor it means stagnation, retrogression in the comparative sense. This factor is often strong in southern countries. The present comparative status of Persia, Greece, Turkey, Italy, Spain, Mexico, South American countries and some of the southern states, is in large measure the resultant of this factor. Lethargy, ignorance and superstition usually go together, though not always. The awakening from lethargy is sometimes very sudden as in the case of Japan and China.

As suggested, national progress is, as a rule, slow. Let us suppose that it takes five hundred years for a primitive nation to develop a civilization equal to the highest. This would mean an average increment of one-fifth of one per cent. in one year, or two per cent. in ten years. National progress is, however, as a rule not appreciable in the course of one year, but the progress (or retrogression) from decade to decade is generally noticeable. The average progress or increment per decade may be represented by 1. A study of the table, which is intended to represent the national status and progressive increment of the United States, will show 181.5 units in favor of progress and 144 units opposed to progress, leaving a balance of 37.5 units or an increment of somewhat more than one for the last decade. (181.5 units + 144 units = 325.5 units would equal 100 per cent. of national progress.) This increment is, of course, variable. In one decade it may be more than one, in another less. The average increment for Japan for the last six decades has been much more than one, more nearly six, indicating a phenomenal national progress. The increment of national progress for the last half decade in China is also remarkably high, as evidenced by the very recent educational and industrial reforms.

The above is a mere outline of the subject. The essential reforms recommended are (1) more efficient nature study in our common schools; (2) establishing two high school courses in order to supplant the freshman and sophomore years, as well as the pre-medical courses of the university; and (3) raising the educational status of the professions, particularly of statesmanship and pharmacy. The oft-suggested plan of establishing a


PROGRESSION.
Agriculture and Horticulture. +20
Commerce. +20
Industrial Labor. +20
Education. +19
Army and Navy. +18
Police. +15
Legislation. +14
Medicine and Related Professions. +14
Journalism. +13
Religious Influence. +12
Philanthropy. +6
Charity. +4
+4
+1
+½
+½
+½
—1
—4
—8
—1
—10
—9
—7
—2
—8
—3
—4
—4
—15 Open Opposition to Progress.
—16 Saloons—Intemperance.
—14 Gambling.
—18 Lethargy.
—20 Ignorance and Superstition.
RETROGRESSION.

national university, which shall be especially devoted to the education of statesmen, is a good one. The small universities and colleges now in existence could, no doubt, be readily adapted to take up the work of the senior high school as suggested. An attempt has been made to give the relative importance of the several national factors without prejudice and without bias.

The literature on education is alarming in its vastness. Each year there are written hundreds of special papers by educational leaders, to say nothing of the numerous monographs and other works on educational topics, the innumerable educational reports and the shorter notes on education in general, and the numerous papers on special training, education, school hygiene, etc., etc. For one man to digest merely this current literature on the subject is well-nigh impossible. This vast literature indicates two things: that the subject is of great importance and that the educational system is not yet properly adjusted. If it were properly adjusted, it would not be given the attention which it receives.

On motion, the joint session then adjourned.

The following report was received from H. L. Taylor, Secretary of the Syllabus Committee, after adjournment of the meeting, in September, 1909, and is here published for the information of all concerned:

At a meeting of the Section on Education and Legislation of the A. Ph. A., held at the Hotel Alexandria, Los Angeles, Cal., Thursday afternoon, August 19th, 1909, the report of the Syllabus Committee was read by title, but not in detail, as it had been previously acted on by the boards and faculties, and was to have been discussed at the joint session the night previous.

The Committee reports:

The Executive Committee's Activity, 1908–1909.—On formal call, this committee met at Albany, N. Y., January 4, 1909. After reports were made on the Hot Springs meetings and a full discussion of the work, it was formally voted to proceed at once with the preparation of the syllabus in detail and to continue the campaign of education. Dr. Rusby was instructed to address a letter to the schools and Dr. Gregory to the boards. The chairmen of the sub-committees were to enter at once on the preparation of copy for submission to their members for revision, correction and suggestion. The Chairman's revise of copy was to be submitted to the Executive Committee for revision and reference to the Committee of Twenty-one. If sufficient progress was made in the preparation of copy, a formal call of the Committee of Twenty-one was to be made for June or August.

This work was sufficiently advanced to warrant the call, and on information that a majority of the committee could be present at Richfield Springs, N. Y., but not at Los Angeles, Cal., the meeting was held June 28. The eight members went into committee of the whole, discussed the report of Chairman Engstrom, and referred it back to the committee for amendments and submission to the Committee of Twenty-one. The New York State Board was requested to publish the syllabus as its report, to afford the committee the same facilities accorded its Report of Progress, but not to issue or distribute the syllabus till final revisions were completed and the syllabus adopted by the committee.

On the New York State Board's adoption of this recommendation, the Executive Committee, by formal votes,

Accepted Chairman Engstrom's revise copy for the Chemistry Branch; ordered it printed, paged and numbered; and submitted to the Committee of Twenty-one for revision, corrections, suggestions, amendments and formal action; also

Chairman Rusby's copy and notes for the Materia Medica Branch; and

Chairman Beal's for the Pharmacy Branch.

Galley proof of so much of the syllabus as could be perfected was placed in the hands of its delegates to the Los Angeles meetings.

The Executive Committee was in session at Los Angeles and voted to recommend the modifications suggested by the Conference at Hot Springs as to assaying, pharmacology, pharmacognosy. It deemed a modification of the definition of medicine unnecessary, and voted it inexpedient to reopen the question of the tentative assignment of hours. The chairman of the chemistry branch reported to the Association of State Boards and the chairman of the pharmacy branch reported to the Conference of Pharmaceutical Faculties, which accepted the reports, continued their relations, and contributed $20 each to the expenses of the year, the New York State Board again incurring the expense of publication as its contribution.

The Executive Committee have submitted to the Committee of Twenty-one the modifications recommended at the Los Angeles meeting as to assaying, pharmacology and pharmacognosy, which have been approved by a majority of the National Committee. The syllabus as amended, will be at once reprinted and submitted to the Committee of 21 for corrections, suggestions and amendments. Its revision by the Committee will permit of its recommendation to the New York State Board, its adoption, and the discharge of the New York State Syllabus Committee.

To provide for its ratification by the American Pharmaceutical Association, the Committee respectfully requests the Chairman of the Section on Education and Legislation to secure through the proper channels authority to place the report of the National Syllabus Committee on special orders for final adoption at the next meeting of the Section.

Signed for the Committee,

WILLIS G. GREGORY, *Chairman.*
HENRY L. TAYLOR, *Secretary,*
HENRY H. RUSBY, *Delegate to the Section and Chairman Materia Medica Branch.*

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—THURSDAY MORNING, AUGUST 19, 1909.

The first session of the Section on Scientific Papers was called to order at 10 : 15 a. m. by Secretary M. I. Wilbert, in the absence of Chairman Charles E. Vanderkleed, who was unable to be present. Mr. Wilbert presided as acting Chairman. A. H. Clark, Associate on the Committee, was also not able to be present.

The Chair referred to the fact that, for several years past, it had so happened that the Chairman of the Section had been unfortunately prevented from attending the annual meeting, and it was particularly unfortunate in the case of Mr. Vanderkleed, who had served as Secretary for two years prior to being elected Chairman, and who was especially anxious to be present, and was greatly disappointed at his inability to do so.

The Chair then called on Mr. Charles W. Johnson, of Seattle, to act as Secretary. He explained that Chairman Vanderkleed had written a letter to the General Secretary announcing his regret at his inability to attend the meeting, and stating that because of this fact he did not think it proper to inflict the customary address upon the members. This was unfortunate, he thought, because Mr. Vanderkleed's address would have been of value to the members and a valuable contribution to the science of pharmacy. He believed, however, that Mr. Vanderkleed could be prevailed upon to present the subject-matter of his address to the Philadelphia Branch, so that it would not be lost to pharmacy itself. With that explanation, he said the Section would now proceed with the regular program.

The report of the Committee on Ebert Prize was called for, and acting Secretary Johnson read same as follows :

REPORT OF COMMITTEE ON EBERT PRIZE.

Your committee begs to report that, in its opinion, the Ebert Prize should be awarded to Henry Kraemer for his paper on "Some of the Distinguishing Morphological Characters of Belladonna and Scopolia."

CHARLES E. CASPARI,
A. B. STEVENS.

The Chair stated that, as he understood, the report had to be adopted by the Section, and he would entertain a motion to that effect.

Mr. Hallberg said he might be mistaken, but he thought the paper referred to in the report hardly came within the scope of the Ebert Prize. Some years ago he was on that committee, and they had carefully considered the terms of the Ebert donation, and his recollection was that the paper awarded the prize must be one on some new pharmaceutical process or question, and that a paper on the distinction between belladonna and scopola would not meet this requirement. He asked that action be deferred until the next session, so that the terms of the prize offer might be considered.

The Chair stated that he understood the prize was to be offered for scientific work, regardless of process; but if it was the wish of the Section, of course action upon the report could be deferred.

M. Francis, of Detroit, asked who appointed the committee to award the prize, and the Chair responded that it was the Chairman of this Section. Mr. Francis then asked if they were invested with the necessary authority to decide to whom the prize should be awarded, and the Chair replied that they were, as he understood, within the limits of the grant. Mr. Francis said if the paper in question came within the scope of the gift of Mr. Ebert, it seemed to him the proper thing to do was to ratify the action of the committee, as otherwise it would lead to debate or a review of the action of the committee. He therefore moved that the report of the committee be adopted. This motion had a second in Mr. M. R. Mason, of San Francisco, and was carried.

The Chair called for the report of the Committee on Drug Market as the next order of business, and said Mr. Rusby had this report, but suggested that it would be well to hold it over for a little while, as Mr. Kebler, of the Drug Laboratory at Washington, was expected to arrive. The next paper on the program was one by Mr. Albert Schneider, on "The Quality and Purity of Drugs on the Pacific Coast," but the author was not present at the moment, and this would also be passed for the time being. He then called on Mr. A. E. DeReeves, of Baltimore, to read the following paper on the purity of drugs and chemicals, by A. R. L. Dohme and H. Engelhart, in the absence of the writers:

PURITY OF SOME OFFICIAL AND NON-OFFICIAL DRUGS AND CHEMICALS.

BY A. R. L. DOHME AND H. ENGELHARDT.

In the proceedings of last year we published an article about the purity of some official and non-official drugs and chemicals, embracing about ten thousand different samples. We herewith submit another account on the same subject, dealing with about nine thousand chemicals and drugs examined during the last year in this laboratory As a whole, the preparations showed up very well; only in a comparatively few cases were we compelled to reject the shipments or samples submitted.

Asafetida.—Again we experienced considerable trouble in obtaining good asafetida. Most of the samples submitted were high in ash and contained considerably less alcohol-soluble matter than required by the U. S. P. We came across samples in which the ash ranged from 20 to 36 per cent., which naturally decreased the percentage of alcohol-soluble matter. As the result of numerous assays, we found that only about 15 per cent. of all the samples submitted to us were acceptable. We found that the sampling alone is not the cause of this unsatisfactory result, for in many instances we examined three or four samples of the same shipment and obtained practically the same results.

Aloin.—To the many different varieties of aloin sometime ago another variety has been added, the so-called sicaloin, derived from aloes which grows wild in Sicily. The aloin in this aloes is present to about 80 per cent., and has been investigated recently by Condo Vissicchio. It is nearly identical with barbaloin, differing from it only by its lacking one methoxy-group.

Aconite Root.—All the samples submitted came up fully to the required strength.

Aconitine.—A sample of aconitine had to be rejected on account of its melting-point; the alkaloid melted at 182° C., while the potent official aconitine should melt at 195° C.

Amylopsin.—We strongly recommend that the Pharmacopœia give an assay process for this ferment; we have come across several samples which were absolutely deficient in amyloptic power.

Ammonium Carbonate.—On one occasion we found that the available ammonia in this preparation amounted to only 28 per cent.

Acetone.—We were compelled to reject a shipment, which although answering all the requirements of the U. S. P., had a strong, pungent odor.

Acetic Acid, Glacial.—A shipment received assayed 79 per cent. of absolute acetic acid only, and was contaminated heavily with inorganic substances, heavy metals and organic matter, the latter rendering the acid brown in color. This shipment was apparently sent by mistake.

Ammonium Chloride.—A sample of ammonium chloride had to be rejected, assaying only 98 per cent. purity.

Atoxyl.—The main difficulty in obtaining a uniform product lies in the differing amounts of water of crystallization which this product contains. It would be advisable to adhere to one product with a definite amount of water, say five molecules.

Beef Extract.—The samples of beef extract varied much in composition, especially in the amount of ash. We found preparations with as low as 14 per cent., and as high as 37 per cent. of incombustible matter.

Beechwood Creosote.—It would be desirable in our opinion for the Committee of Revision of the U. S. P. to take up the tests for beechwood creosote, as with the test outlined in the present U. S. P., spurious products may escape.

Belladonna Leaves.—We examined fifty-two samples of this drug, of which nine were insufficient in alkaloidal strength. While we did not experience any difficulty in obtaining shipments of the drug containing .5 per cent. of total alkaloids, we had to reject samples which assayed only .11, .12, .19 per cent., etc.

Belladonna Root.—Fourteen samples out of thirty-five of this drug were too low in alkaloidal content, some assaying as low as .13, .19 per cent., etc., of total alkaloids.

Conium Leaves.—Every sample submitted to us had to be rejected. The amount of coniine in this drug amounted to 0.05 per cent. at most. It is difficult to understand why a drug which is so prone to deterioration, is used at all.

Cinchona.—Two samples out of fourteen of red cinchona bark and four samples out of sixteen of calisaya bark were rejected on account of the low percentage of alkaloids present. Two samples of the latter variety assayed as low as 2.9 per cent. and 3.7 per cent. respectively of total cinchona alkaloids.

Colchicum Root.—Two samples out of fifteen did not meet the alkaloidal strength required by the U. S. P.

Colchicum Seed.—Twenty out of twenty-nine samples contained less colchicine than required, *i. e.*, .45 per cent.; some yielded .11, .12, .24 per cent., etc., of colchicine. In connection with the assay process for colchicum root and seed and the preparations thereof, we wish again to emphasize that the assay processes as given by the U. S. P. are not reliable and should be revised.

Collodion.—Several shipments did not come up to the required amount of pyroxylin, *i. e.*, 40 per cent.

Calcium Phosphate Precipitated.—One sample had to be rejected on account of containing an excess of chlorides.

Cocain Hydrochloride.—One shipment showed an excessive amount of isatropyl-cocaine.

Carbolic Acid.—Several shipments were below standard, assaying from two to four per cent. of absolute carbolic acid less than required.

Calcium Chloride.—A shipment which assayed only 70 per cent. had attracted a considerable amount of water.

Camphor.—We did not meet with any synthetic camphor this year. Considerable work has been done in distinguishing this product from the natural.

Chlorinated Lime.—This year again we were compelled to reject several shipments of chlorinated lime, which yielded considerably less available chlorine than required by the U. S. P.

Cudbear.—The samples submitted to us varied considerably in coloring power.

Ergot.—The samples and shipments of ergot received were, with one exception, chemically and physiologically of very good quality. One sample was physiologically inactive, and the chemical examination also showed that the drug hardly contained any cornutine.

Gaduol.—A shipment of this preparation, while answering all the requirements laid down in the various text-books, became thick after standing for some time, apparently due to an excessive amount of solid fatty acids.

Henbane.—Three out of fourteen samples had to be rejected because of insufficient alkaloid.

Hydrocyanic Acid.—We were compelled to reject two lots of this acid assaying below 2 per cent. of HCN.

Hyoscine Hydrobromide.—One shipment, which apparently was sent by mistake, as the active variety was specified when ordered, melted at 181° C., and proved to be optically inactive. The question is still open, whether or not the optically active variety is therapeutically just as valuable as the inactive one.

Hydrogen Peroxide.—While the addition of acetanilid to this preparation preserves it very well, we noticed that at times, after a comparatively short time, a marked odor of nitro-benzol is developed

Honey.—One shipment of honey contained an excessive amount of cane-sugar.

Ipecac.—Only one sample out of eight had to be rejected, and that because it contained only 1.94 per cent. of total alkaloids.

Iron Chloride.—One shipment showed an excessive amount of iron oxychloride, and consequently could not be used for making tincture of iron chloride.

Jalap.—Of eight samples of jalap examined three had to be rejected, the amount of resin present being below the requirements of the U. S. P. In only one case we were able to obtain a large shipment of this tuber, which assayed as high as 11 per cent. of resin.

Jamaica Rum.—We received several consignments of Jamaica rum which were entirely deficient in alcohol, the percentage of the latter amounting to only 52 to 53 per cent., while a good Jamaica rum should contain at least 70 per cent. of alcohol.

Lactic Acid.—On several occasions we found this acid to be slightly below standard, assaying 74, 73, 72 per cent., etc., as compared with 75 per cent. of absolute lactic acid required.

Lead Acetate.—On a few occasions this chemical was not as soluble as required.

Lead Oxide.—Two shipments which were insoluble in diluted nitric acid had to be rejected.

Licorice.—One shipment contained an excessive amount of ash.

Lithium Bromide.—A shipment besides possessing a brownish color, assayed 93 8 per cent. of absolute lithium bromide.

Lupulin.—Various samples submitted did not at all come up to requirements of the U. S. P. They were deficient in ether-soluble matter (47 per cent., 50 per cent., 43 per cent.) and exceeded the amount of ash allowed considerably (29 per cent., 30 per cent., etc.).

Methylene Blue.—We wish to point out again that the requirements of the U. S. P. for ash are rather strict. We again received samples of this dyestuff which besides being chemically perfectly pure and having the proper coloring power yielded an excess of ash on incineration amounting to as much as one per cent. The ash was free from zinc.

Magnesium Glycerophosphate.—One shipment had to be rejected as not being perfectly soluble in water.

Milk Sugar.—A very interesting investigation of the examination of milk sugar has recently been published by Hillrighaus and Heilmann. These authors found that when the test for cane sugar as adopted by the corrections of the U. S. P. of May 1, 1907, is carried out at a temperature exceeding 20° C., incorrect results for the amount of cane sugar are obtained. They found by experiment that diluted alcohol dissolves cane sugar in proportion as the temperature increases. Therefore, they advocate that this test should be carried out at a temperature below 20° C. After thorough investigations upon the action of sulphuric acid on milk sugar to detect cane sugar in the latter, the authors offer as a modification that the test should also be carried out at a temperature below 20° C. and that the milk sugar should be finely distributed on the sulphuric acid. If these modifications are used, the test for cane sugar according to their statement is just as accurate as that adopted by the corrections of the U. S. P. It may be of interest to note that the Japanese Pharmacopeia has retained the sulphuric acid test.

Mercury Succinimide. — We found that the mercury content of this new therapeutic agent varies much, we having received samples with as low an amount of metallic mercury as 43 per cent., while the theoretical amount is about 50 per cent. For a determination of metallic mercury, the well-known reduction method by hypophosphorous acid may be used or the following method: 0.3 Gm. are heated to a gentle boil with 5 Cc. concentrated sulphuric acid and 4 Gm. potassium sulphate in a flask of

about 150 Cc. capacity, to which is fitted a condenser tube about 40 Cm. in length. The mixture is heated until it becomes clear like water. The condenser tube is then rinsed with 5 to 10 Cc. of concentrated sulphuric acid, allowing the rinsings to run into the flask. About 0.1 Gm. potassium permanganate is then immediately added until the mixture acquires a red color and then heat is applied until the mixture becomes colorless. The mixture is then allowed to cool, whereupon it is diluted to 100 Cc., 2 Cc. of iron and ammonium sulphate are then added and the cold solution is titrated with decinormal sulphocyanate solution to incipient brownish-red.

1 Cc. $\frac{N}{10}$ sulphocyanate = 0.010015 Gm. Hg.

Nitrous Ether.—One shipment which assayed 85 per cent. of absolute ethyl nitrite had to be rejected.

Nux Vomica.—Two samples out of ten were deficient in strychnine.

Opium.—On several occasions we obtained shipments of opium which barely assayed 9 per cent. of morphine. In one case the morphine present amounted to 8.12 per cent. The results were checked by calculating the morphine from the galenical preparations prepared from the respective shipment.

Olive Oil.—The output of olive oil in Italy this year is said to be a very small one. Therefore, adulterations with sesame oil, cottonseed oil, etc., might easily be suspected. To detect these adulterations the nitric acid and phloroglucine reaction was recommended, which, however, as Dietze found, is not absolutely reliable, as even perfectly pure olive oils give a slight pinkish color when brought in contact with these reagents. This statement of Dietze was later on contradicted by Kruer, who found that pure genuine olive oil does not produce any coloration. He therefore considers this reaction as valuable for the detection of the above adulterations.

Oleic Acid.—On one occasion we were compelled to reject a shipment of this acid which contained an excessive amount of solid fatty acids.

Potassium Carbonate Calcined.—Two shipments were returned to the manufacturer on account of a pronounced blue color and assaying only 90 per cent. of potassium carbonate.

Potassium Chlorate.—Particulars about this article will be given in a paper to be read before this Association. All electrolytic potassium chlorate should be recrystallized before being offered for sale.

Quinine and Urea Muriate.—We again found that the melting-point of this preparation very often is higher than that given in the text-books, which is from 70 to 75° C. We found several samples which contained the proper amount of quinine, etc., melting at about 130° C.

Reduced Iron —In several shipments we found an excess of sulphides, and in some instances a deficiency in iron. Several samples assayed from 80 to 90 per cent.

Rennet.—The excessive use of this ferment would justify an assay process in the next edition of the U. S. P.

Sodium Phosphate.—A few shipments contained an excessive amount of sulphates.

Stearic Acid.—The melting-point of the commercial variety varied considerably.

Sodium Nitrite.—One shipment was rejected on account of the yellow color and the strong odor of nitrous acid.

Sulphurous Acid.—A shipment which contained only 4 per cent. of sulphurous acid and was hence unfit for use, was rejected.

Saccharine.—By mistake a shipment of the sodium salt of this chemical was sent. Would it not be justifiable to make this preparation official also, as it is more soluble and has nearly the same sweetening power as benzosulphinide; in fact, it is in every way preferable.

Strontium Salicylate.—One shipment showed a reddish color, apparently due to the presence of slight traces of iron salt.

Scopola Root.—Only ten out of fourteen samples of this root came up to the strength required by the U. S. P. While in former years, as we have pointed out on several occasions, a drug containing .7 per cent. and more of total alkaloids could easily be obtained, such root at the present time is very scarce. It has been claimed that the root of Scopola atropoides is very often adulterated with the Japanese root, which rarely contains more than .3 per cent. of total mydriatic alkaloids.

Stramonium Leaves.—The samples submitted were of a very good quality, as out of nine only one had to be rejected, which assayed only 0.07 per cent. of total mydriatic alkaloids.

Terpineol.—One shipment varied in specific gravity and boiling-point.

Venice Turpentine.—A part of one shipment, after standing for some time at a moderate temperature, became granular, apparently due to an excessive amount of resin present.

Zinc Oxide.—A shipment of zinc oxide which showed a decidedly yellow color had to be rejected. Otherwise the preparation answered all the requirements of the U. S. P.

The volatile oils examined during the last year made a still better showing than those of the year before, with the following few exceptions.

Oil of Cinnamon contained copper and lead and was insoluble in 70 per cent. alcohol; another lot which contained copper also was contaminated with rosin and exhibited a dark, almost black, color and a bad odor.

Lemon Oil.—One sample contained water.

Oil of Wintergreen, Natural.—Had a dark red color.

Oil of Rose Geranium.—The optical rotation in one shipment was entirely too high and the oil was insoluble in 70 per cent. alcohol.

Oil of Cade.—The official requirements for this oil should be made more stringent.

In conclusion we wish to say that the next edition of the U. S. P. should provide for tests for several oils which are used quite extensively, among

others oil of bergamot, oil of sassafras, oil of origanum and oil of Pinus sylvestris.

Baltimore, June, 1909.

The Chair stated that the program contained several papers emanating from the Bureau of Plant Industry, on the cultivation of medicinal plants, and for the sake of saving time until certain gentlemen on the program for papers appeared, the Section might anticipate a little, and take up one or two of these papers on the cultivation of medicinal plants. He would therefore call on Mr. A. F. Sievers, a gentleman connected with the Bureau of Plant Industry, at Washington, D. C., to read a paper on camphor cultivation submitted by R. H. True and S. C. Hood. Mr. Sievers presented the paper accordingly:

AMERICAN GROWN CAMPHOR.

BY R. H. TRUE AND S. C. HOOD.

The camphor tree has been well known in the southern United States as an ornamental shade tree for fifty years or more, having been widely distributed throughout the South by the early Commissioners of Agriculture. It has proved hardy over wide areas, especially in Florida, California and along the Gulf strip, and is now a standard tree to plant where a tall, dense hedge is required as a windbreak. About six years ago an investigation into the camphor content of these trees was begun by the Office of Drug Plant Investigations, Bureau of Plant Industry, through Mr. W. O. Richtmann, then a member of that organization. It soon appeared that the American-grown trees contained sufficient gum and oil to encourage further investigation. This work has now been in progress long enough to develop certain features of the situation, which may be here outlined.

The camphor tree seems to adapt itself very easily to most varied types of soil from the white sands of the Florida high pine lands to the dense sticky rice lands of Texas. It grows well in the dry climate of Southern California, and excellently in the rainy parts of the Gulf strip. When once established the tree is very plastic and appears to endure severe handling, and heavy pruning with a minimum of disturbance. It is easily propagated from seed collected in the late fall or early winter, provided the berries are planted before drying out. It appears that the best results are obtained when the seeds are planted under a slat shade which reduces the light to half intensity, but a recent experiment shows that fair results are obtained by planting in well-drained, sandy, open ground. The plants grow rapidly, and when five years old are from 12 to 15 feet high, with a thick pyramidal or oval top of shining evergreen leaves.

Camphor is found in the leaves and twigs in the seedling stage, and increases with the growth of the tree in age and stature. Distillations carried out chiefly on Florida material show the presence of camphor and

camphor oils in varying proportion throughout the tree. The leaves and younger twigs are richest in distillate, yielding on the average about 1½ per cent., calculated on the green weight. This distillate consists generally of about 80 per cent. gum and 20 per cent. of oils. The older twigs show a much larger percentage of oil and in the older parts very little gum. The root yields a white oil almost lacking in camphor, but strongly suggesting oil of sassafras in its odor.

In view of this showing of constituents, we have concluded that trees grown for camphor gum and oils will give the best results when grown in the form of a hedge which can be clipped by power machinery once or twice a year. In this way, the constituents may be obtained without sacrificing the tree and the trees may be made the source of an annual income.

We have devised and have now in experimental operation a small factory in which special apparatus designed for handling this crop is tested practically. The solid nature of a large portion of the distillate draws especial attention to the condenser. Several types of design have been made and tested with promising results.

We have obtained the use of sixty acres of suitable land at Orange City, Fla., for experimental work, and are devoting 50 acres to camphor. Here we are planting out trees in hedges and in various other arrangements for the purpose of testing practically various methods of handling the trees.

It may be interesting to know that these trees are in part either directly imported as seeds or as seedlings from Japan and southern China. The majority are from Florida-grown seed. Since it appears that individual camphor trees vary rather widely in their camphor content, we have exercised careful selection in choosing seeds for propagation. A measured quantity of twigs and leaves of the seed-bearing trees were tested, in every case by actual distillation, and only such seeds were sown as came from a parentage showing a high camphor yield. We hope by this kind of selection, persistently practiced, to obtain in time strains of trees rich in camphor.

The process of treating the crude distillate consisting of gum and oils is rather simple. The solid gum is easily strained from the oil and water, and is dried in a high-speed centrifuge. The oil saturated with camphor separates in large part from the water on standing and is readily drawn off, the water going back to the steam-producing source, the oil being accumulated for further treatment. This consists essentially in freezing out the camphor, which constitutes roughly 50 per cent. of the volume of the freshly distilled oil. This camphor is dried by centrifugal treatment and added to the main crop, and the oil is ready for fractionation or whatever further treatment is desired. The gum obtained by this process consists of snow-white flowers containing a very small percentage of oil.

We hope to be able to carry out purification to such a point as shall render a refining process unnecessary.

The question of profit and loss is still largely one of estimates with us, but the evidence thus far points toward a distinctly favorable outcome.

Office of Drug Plant Investigations, Bureau of Plant Industry, Department of Agriculture, August 6, 1909.

Discussion was invited on the paper, but none was offered. The Chair stated that, without objection, the paper would take the usual course, and it was so ordered.

Mr. Rusby was now requested to present the report of the Committee on Drug Market, which he did. He preceded his reading of the report by saying that the method pursued by the Committee on Drug Market was that of collecting samples of drugs and desirable information through the members of the committee, which information and samples are forwarded to the Chairman, who distributes portions of these samples to the various members of the committee, without anything to show from whence they come. He subsequently receives reports of their examinations, and tabulates these reports. The supposition is that this work is to be done and a complete report given out by the Chairman in time for the members to receive the report in advance of the annual meeting, express their views upon it, communicate the same to him, and have the report amended so as to represent the views of the entire committee before being finally presented to the Association. He said he took it for granted that it was not necessary to remind those who had had experience in research work that they had great difficulty in finding time to do this work, and in this case the committee were late about it. Mr. Patch had most of this work to do, and the report of the committee did not get to some of the members in time for them to read it. He himself had received his copy after he had reached Los Angeles. He had gone over it, and had some comments to make, but had not had time to communicate with Mr. Patch. He mentioned this to show that what he had to say on this subject was to the Association in open session, and that he had not communicated with Mr. Patch for lack of opportunity. Mr. Rusby then proceeded to present the committee's report in full verbal abstract, with copious comments and frequent expression of disagreement from the position taken in the report.

REPORT OF COMMITTEE ON DRUG MARKET.

There appears to be constant advance in the line of improvement in quality of products and in general attitude of the trade, but many things remain to be remedied.

Some Boards of Health and Committees on Adulteration formerly tabulating the slightest variation from standards as adulterations, so giving a false impression to the public, are adopting the more reasonable course of stating that the products named vary from standard.

It is still wise to move slowly in condemning products and discrediting dealers. There

is great lack of uniformity in methods of criticism and men of good reputation express very divergent opinions.

A few illustrations will answer to demonstrate this point.

PINKROOT.

Samples of whole root were submitted to the members of our Committee for report with the following results.

	Committee 1.	*Committee 2.*
Sample 1.	Ruelli, some pinkroot.	Mixture.
Sample 2.	Fair sample true pinkroot.	Nearly all pinkroot.
Sample 3.	All ruellia.	Mixture.
Sample 4.	Nearly all true pinkroot.	Nearly all pinkroot.
Sample 5.	Ruellia and other foreign roots, little pinkroot.	Mixture.

Committee 3. No report.

	Committee 4.	*Committee 5.*
Sample 1.	Mixture.	Ruellia.
Sample 2.	Nearly all pinkroot.	Half foreign roots.
Sample 3.	Mixture.	Ruellia.
Sample 4.	Nearly all pinkroot.	Mostly foreign roots.
Sample 5.	Mixture.	

Committee No. 1 based results almost wholly on careful microscopical examination, using Stockberger's illustrations as a guide and comparing with the article appearing in the March number of Druggists Circular.

The party furnishing sample No. 5 objected to report that it was partly ruellia. They had it examined by their own Assay Department, by the authorities of their College of Pharmacy and other experts, who stated that there was no ruellia present, but some phlox.

At their request we submitted a sample of what had been pronounced by some of the committee as true pinkroot and three other samples. These they compared with "An authentic sample of Spigelia Marilandica obtained from Prof. Henry Kraemer, who had the growing plants under his observation."

The sample pronounced true pinkroot by three observers, they reported to "consist largely of true pinkroot, Spigelia Marilandica and two other species."

Another which had been identified as mostly ruellia, they reported to "consist largely of a species, not Spigelia Marilandica, a small proportion only of true root being present."

Another pronounced ruellia they reported to consist of one-third true pinkroot but a large portion the same as the predominating variety in their sample No. 2.

The fourth specimen, a mixture of the last two, was reported to "consist largely of a species having a large rhizome and roots proportionally much smaller than seen in Spigelia Marilandica; the microscopical structure closely resembling genuine Spigelia, but the physical appearance very different.

"None of the samples contained ruellia ciliosa, as may be easily demonstrated by absence of stone cells and cystoliths."

It looks as if a court and twelve good men and true could not be positive of the true status of these samples from the expert testimony presented.

TURMERIC.

A retail druggist was complained of for selling inferior and adulterated turmeric. It having been brought to our attention, we pronounced it inferior but not adulterated.

We submitted to our committee two portions of the sample in question, "I" and "J," with several others obtained from leading retail stores in Boston. We give table of results reported by the different members of the committee. You will notice that reports on the "I" and "J" are quite various.

Committee No. 1 reported foreign starch. No. 2 pronounced pure. No. 3 found traces of wheat starch and mineral salts. No. 4 pronounced pure. No. 5 stated that they consisted largely of a substance having very large cells not present in the pure sample.

One reported 56 per cent. of normal coloring power; another, 28 per cent. normal coloring power.

One found foreign starch in the sample freshly prepared from select whole root; another found a few round granules differing from typical turmeric starch; another found it pure; another found a trace of starch; another found it pure with a few starch grains and excess of sand.

POWDERED TURMERIC TABLE.

	Ash.	Chemist.		Coloring Power.		Non-volatile Ethereal Extract.	Alcoholic Extract.	Loss at 110° C.
	No. 1.	No. 2.	No. 3.	No. 1.	No. 5.	No. 2.	No. 5.	No. 3.
Sample A ...	8%	7.65	6.28	100	100	8%	9.3	9.59
Sample B ...	6%	6.6	5.66	100	125	7.75	9.4	10.09
Sample C ...	7.5	7.4	5.47	100	111	8.3	9.3	10.11
Sample D ...	14.5	17.	17.5	80	41	5.5	6.	11.39
Sample E ...	15.5	16.3	16.63	80	45	5.85	7.2	10.45
Sample F ...	15.5	17.5	17.7	80	37	5.55	6.3	10.43
Sample G ...	6.5	6.9	6.6	80	62	6.45	9.3	8.93
Sample H...	15.5	16	16	80	62	5.8	7.8	10.69
Sample I....	6	7.6	5.98	56	28	6.6	4.7	10.50
Sample J ...	6	6.2	6.66	56	25	7	4.5	11.20

Microscopic Report of Chemist No. 1.

Sample A. A few round granules differing from typical turmeric starch.
Sample B. Like A.
Sample C. O. K.
Sample D. Few round granules.
Sample E. Abundance of large round and oval granules.
Sample F. Like E.
Sample G. Few large and oval, round.
Sample H. Very few large and oval, round.
Sample I. Few and oval, round.
Sample J. Few and oval, round.

Microscope.	Chemist No. 2.	Chemist No. 3.	Chemist No. 4.	Chemist No. 5.
Sample A ...	O. K.	Trace of starch.	Pure, few starch-grains, more sand than a good specimen.	O. K.
Sample B ...	O. K.	O. K.	Exhausted drug mixed with pure.	O. K.
Sample C ...	O. K.	O. K.	Pure, few scattered fibers.	O. K.
Sample D ...	Flour and mineral matter.	Wheat starch and mineral matter.	Considerable adult. with foreign starch.	Admixture like I. and J.
Sample E ...	Flour and mineral matter.	Corn starch, wheat starch and mineral matter.	Heavily adult. with foreign starch.	Added starch.
Sample F ...	Flour and mineral matter.	Wheat starch and mineral matter.	Heavily adult. with foreign starch.	Added starch.
Sample G ...	Woody fiber unknown.	Woody unknown fiber. Trace of starch.	Heavily adult. with barberry bark.	Admixture like I. & J.
Sample H...	Flour and mineral matter. Alkaline adulterant.	Wheat starch and mineral matter.	Heavily adult. with foreign starch.	Admixture like I. & J.
Sample I....	O. K.	Trace of wheat, starch and mineral matter.	Pure.	Consists largely of a substance having very large cells not present in A, B, C.
Sample J....	O. K.	Trace of wheat, starch and mineral matter.	Pure.	do.

A, sample prepared from select whole root.

B, C, D, E, F, G, H, samples from leading Boston stores. I & J, both alike, from a leading Boston store.

Chemist No. 1. Ash ranges in select samples from 6 to 8 per cent. Considerable difference in odor and taste of different samples. Found large round granules resembling wheat starch in drug of own powdering.

Chemist No. 2. Ash ranges from 6 to 7.5 per cent. non-volatile ether extract from 7 to 8½ per cent. Great variation in tinctorial power of pure samples. Turmeric contains 30 to 40 per cent. of natural starch and may be pronounced adulterated by the inexperienced man.

Chemist No. 3. Ash ranges from 7 to 8 per cent. Average moisture 9 per cent.

POWDERED LICORICE ROOT.

A sample was complained of as being largely adulterated with starch. The condemned sample, one freshly prepared from selected whole roots, and four others were submitted for examination.

	True.	Ash.		Insoluble in weak ammonia.		Foreign starch tissue and mineral impurities.	
	Chemist Nos. 1–2.		1.	2.	1.	3.	
Sample A.	6.3%.	6.25%.	66.5%.	65.8%	Normal.	Normal.	Absent.
Sample B.	9.0%.	8.75%.	68%	64%.	Part swollen.	Foreign appearance-	Absent.
Sample C.	6.9%.	6.65%.	71%	67%.	Part swollen.	Foreign appearance.	Absent.
Sample D.	9%.	8.95%.	68.1%.	56.9%.	Mostly normal.	Foreign appearance.	Absent.
Sample E.	6.3%.	5.7%.	64.5%.	53.6%.	Normal.	Normal.	Absent.

Chemist No. 1 concluded that B. C. D. contained some exhausted licorice.

DOMESTIC CRUDE DRUGS.

Attention has frequently been called to the difficulty of obtaining domestic crude drugs in a reasonably clean condition. Admixture with foreign articles is very common and dealers do not take the trouble of picking the drug over, nor frequently of separating earth and sand from root drugs. This latter point may seriously affect the strength of the powdered drugs or of preparations made from it.

JALAP.

In view of the steadily increasing output of immature jalap with consequent low yield of resin, it may be advisable to drop the crude drug altogether from the U. S. P., and replace it in all preparations by the resin of jalap, to secure uniform results.

SYNTHETIC CAMPHOR.

Provision should be made in the next U. S. P., whereby the use of synthetic camphor in camphor preparations may be permissible.

A prosecution under the English Food and Drug Act was brought against a druggist for using synthetic camphor in liniment of camphor.

MEXICAN SCAMMONY.

The bulk of the "resin of scammony" sold to-day is the product obtained from the so-called Mexican scammony or male jalap. Little is made from true scammony root.

Would it not be well to permit this officially by including male jalap in the U. S. P. in view of the known identity of the native principles of the two drugs.

COPAIBA.

The African variety is being imported in large quantities, mainly for the purpose of extending the South American product. Its physiological action is apparently similar to that of South American copaiba; and in view of its increasing use abroad it might be well to include the plant from which it is derived among the sources of the official article.

HYOSCYAMUS.

In view of the fact that the alkaloid of Hyoscyamus Muticus, Egyptian henbane, has been proven to be almost pure hyoscyamine and the alkaloid contents are far in excess of the contents of the official drug, the question arises as to whether some mention of it should not be made in the U. S. P., still maintaining the present alkaloid strength of hyoscyamus preparations if desirable.

PODOPHYLLIN.

The greater proportion of podophyllin being offered as U. S. P. is below the standard. Mr. Gane thinks the variation from former market conditions is due to the character

of the mandrake root now offered being materially inferior to that formerly supplied. Allowing this, the question arises whether the use of solvents other than alcohol and addition of metallic precipitants are not more responsible for the inferior grades.

While the suggested standards of 64 per cent. ether solubility, 74 per cent. chloroform solubility and 96 per cent. alcohol solubility would pass a much larger proportion of the market lots, it is to be decided whether this drop is called for when alcohol is used as a solvent and the official process followed.

See table for results of examination of samples. Gordin & Merrell suggest check assay for per cent. of picro-podophyllin, the average of which should be 22 per cent.

One State Board of Health reports collecting 3,368 samples from pharmacists, and only 361, or 10.72 per cent., were in any way defective. The greater part of these were confined to five articles: 101 camphor liniment, 73 chloroform liniment, 36 spirit of camphor, 86 tincture of iodine, 51 solution of magnesium citrate—total 347.

Another reports 20 per cent. varying from standard.

Offenders against the purity of ground drugs seem to be the drug millers. A sample of adulterated turmeric purchased of a reliable house was declared to be adulterated by the miller; the same with a sample of po. soap. Dr. Rusby has stated that reputable houses have sent fine-quality goods to the miller to grind and the latter has abstracted one-half and substituted inert material. He has also called attention to the fact that this condition is liable to continue, as there are not ten men in the United States who can examine drugs with the microscope with certainty.

DEPRECIATION IN QUALITY.

Dr. Schieffelin reports a series of experiments to determine loss in preparations of alkaloidal drugs due to age. He concludes there is no loss within a year, except in case of coca, belladonna, aconite and hyoscyamus. Gane & Webster report a very extensive series of tests covering a period of two years, and including products from nine to twenty-five years old. Their deduction is that no appreciable loss took place.

OIL OF ANISE.

Various samples have an objectionable dextrogyration. One sample was 0° 19′. Submitted to sellers, it was pronounced adulterated with impure anethol, which admixture must have been made by the Chinese distiller or one of the intermediate agents.

Some sellers state that oil of anise as obtained from primary sources is not U. S. P., and they sell in original packages without such guarantee.

OIL OF FENNEL.

Much oil sold does not answer the official requirements.

Seller claimed error in shipment, in one case French oil having been sent instead of German oil. He claims that there are ten varieties of oil on the market.

OIL OF EUCALYPTUS.

Investigation shows that this oil contains dextrogyrate and lævogyrate constituents, the effect of the former usually preponderating. As by the natural variation in composition the balancing point can shift from 1° to 15°, there is no reason why the lævogyrating part may not occasionally over-balance the dextrogyrate part and the oil turn somewhat to the left.

If the oil is otherwise U. S. P. there should be no objection to mixing such lævogyrate oils with dextrogyrate.

We have found no particular difficulty with the U. S. P. process for cineol estimation in oil eucalyptus and have received concordant results with duplicates. Whether there is a better process or not we are not prepared to say.

We note that Parry recommends that the oils of low test should be first fractionated to get good results, and that in oils above 30 per cent. there may be an error of 3 per cent. We also note that he adds the acid directly to the oil. If the greatest care is not taken. some of the uncombined oil enters the magma and causes an error. The U. S. P., by dissolving the oil in petroleum benzin seeks to prevent this error. The solvent subdivides the oil and ensures its complete contact with the acid. The statement that a red color shows addition of excess of acid does not appear to have any value. The color may be yellowish or pinkish from the start, and not grow much in intensity with oils answering other U. S. P. requirements.

After washing the ppt. with petroleum benzin and drying by pressure, all petroleum benzin should be allowed to evaporate, or it may be read as cineol when the ppt. is decomposed. If a sample yields the proper percentage by the U. S. P. process, we do not feel called upon to check it by any other.

A high gravity may be an indication of a good percentage of cineol, and as the cineol is optically inactive, its presence in large proportion must affect the optical activity by varying the proportion of the terpene present. Gildermeister and Hoffman state that pinene and other terpenes are present with lævogyrate ester, but give the rotatiou as $+1^{\circ}$ to $+15^{\circ}$.

It is stated that phellandrene is both dextrogyrate and lævogyrate, so that its presence is not indicated by the rotation.

As it is known that the pinene of American oil of turpentine may be either right or left rotary, it is possible that the pinene of eucalyptus oil may vary in the same way. The B. P. seems to take this view in passing $+10^{\circ}$ to -10° oils. It has been stated that dealers mix right and left rotary oils to produce a product to meet the U. S. P. requirements in this particular.

Examination of eight samples by U. S. P. method gave absence of phellandrene in excess, from 60 per cent. to 75 per cent. cineol, rotation -1.9° to $+1^{\circ}$. All other tests were satisfactory. Two lots from different sources had -1.9° rotation and each was guaranteed to be pure."

One Essential Oil House notifies the trade, thus:

"After convincing ourselves that it is impossible to give a guarantee for the genuineness of oil of wintergreen leaves, and after further convincing ourselves that the whole distillation of the oil is in such limited quantities that it may be considered unobtainable, we have come to the conclusion to discontinue entirely the sale of oil of wintergreen leaves, natural.

Dr. Kebler states that genuine gaultheria oils will not answer the U. S. P. requirement of forming a clear solution with KOH test solution. Only the artificial methyl salicylate will answer it. Oils absolutely known to be pure will not meet this requirement.

True gaultheria oil will not form a clear solution with KOH test solution. The statement of the U. S. P. that it will, should be restricted to methyl salicylate. True gaultheria oil and KOH test solution form a more or less cloudy mixture and on standing, deposit small droplets of oil having a peculiar tea odor; the droplets consist of paraffins and other compounds present in quantity of about one per cent. The oily separation from 1 Cc. may be 0.02 Cc. The amount varies in different oils attributed to the stage of vegetation and mode of distillation. If the latter is not continued long enough, the paraffins go over only very sparingly and the oil is almost clearly soluble in KOH test solution. If the material is not sufficiently fermented before distillation the yield of methyl salicylate is lower and the oil contains relatively more of the insoluble paraffins.

BALSAM PERU.

Your Committee were notified that large quantities of artificial product were being sold for the genuine, but we were unable to obtain any samples known to be artificial.

The exploiters of the so-called synthetic balsam state that the natural product is adulterated largely with pine resin, gurjun balsam and turpentine balsam, and recommend their substitute as "equal to the pure in its main constituents, in its internal consistency," etc., and owing to the difficulty of proving with certainty the adulteration of the natural balsam, they recommend the substitution of the synthetic. The matter is worth investigation.

We believe that the synthetic product is marketed by Schutz & Co., Hamburg. It has been stated by R. Dieterich that it is a mixture of cinnamein, storax, benzoin and other resins (probably from tolu balsam). It is claimed that concentrated sulphuric acid allowed to carefully flow under an ethereal solution of this product, or a mixture of 50 per cent. of this product and genuine balsam, will give a green color at point of contact. If concentrated hydrochloric acid be next flowed in, we have a layer of sulphuric acid, a red zone, a layer of hydrochloric acid, a green zone, a layer of ethereal solution. With pure Peru balsam a reddish-brown colored zone is formed.

The details of the test are given in the Pharm. Journal for May 23, 1908.

ASSAYED DRUGS AND TINCTURES.

It is suggested that all bales and packages of crude drugs for which there is an official standard have a distinctive label attached, giving assay showing how they vary from that standard.

Attention is called by Mr. Vanderkleed to the importance of assaying standardized tinctures of assayed drugs and not placing dependence upon the extraction of the drug giving a uniform product.

He found tincture of aconite 85 per cent. over strength, tincture of belladonna 48 per cent. over strength, tincture of colchicum 250 per cent. over strength, tincture of digitalis 35 per cent. below standard, and tincture of nux vomica 7.5 per cent. below standard.

PHOSPHORIC ACID.

As an interesting illustration of unintentional variation from standard we quote phosphoric acid. Two original containers were received as 85 per cent. acid.

No. 1, tested by chemist "A," had sp. gr. 1.6375 @ 25° C., corresponding to 79 per cent., titrated 78.99 per cent.

No. 1, tested by chemist "B," had sp. gr. 1.6375, corresponding to 79 per cent. titrated 80.27 per cent.

No. 2, tested by chemist "A," had sp. gr. 1.65640, corresponding to 80.6 per cent., titrated 80.5 per cent.

No. 2, tested by chemist "B," had sp. gr. 1.6556, corresponding to 80.6 per cent., titrated 82.54 per cent.

Complaint was made to the manufacturers and samples sent.

No. 1,	tested by chemist	"C,"	titrated	82.48	per cent.
	"	"D,"	"	80.7	"
	"	"E,"	"	81	"
No. 2,	"	"D,"	"	82.2	"
	"	"E,"	"	83.4	"
	"	"F,"	"	84.24	"

A portion from No. 2 container had been used. The remainder was stored in a warm place for a few days and thoroughly well mixed and again tested. Sp. gr. 1.7390, titration 88.72 per cent.

No. 1 container tested the same way had sp. gr. 1.6870 and titrated 84.59 per cent.

Evidently the concentrated acid stored in a cold place fractions by condensation and should be warmed and well mixed before being used. Exposing a lot to a lower tem-

perature, it partly solidified. Two new lots uniformly mixed were submitted to comparative tests:

No. 1 Chemist	"A" 85.86%.	"B" 85.87%.	"D" 87.5%.	"F" 88.49%.
No. 2 Chemist	"A" 85.67%.	"B" 85.41%.	"D" 87.2%.	"F" 88.4%.

ALCOHOLICS.

The action of the Internal Revenue Department in prohibiting the sale as medicines of products nearly destitute of medicinal activity, aside from the stimulant action of the alcohol they contain, is a step forward in the protection of the public, although it may be a temporary hardship on the pharmacists, having such products in stock purchased on the same basis as other proprietaries, to meet a popular demand without knowledge of their medicinal qualities. Besides, quite an array of proprietary cordials, bitters, etc., that have been condemned, beef, iron and wine has come in for a share of disfavor. While the present sentiment is against much medicinal quality being ascribed to extract of beef, the fact remains that beef, iron and wine containing a moderate amount of extract beef and citrate of iron has been and is being prescribed by many physicians as a desirable chalybeate tonic. The prescribed requirements that a standard article should represent at least the amount of extract of beef and iron called for by the N. F. seem to be desirable in view of the great variation in the market product. The product made strictly by the N. F. varies with the quality of extract of beef used and with the manipulation employed.

The Conn. Agricul. Exp. Station report the results of assay of five lots made by them: Alcohol by volume, 19.5 to 27.18 per cent.; extract, 12.36 to 14.12 per cent.; ash, 0.723 to 0.401 per cent.; iron, 0.011 to 0.123 per cent.; total nitrogen, 0.178 to 0.278 per cent.; nitrogen as ammonia, 0.007 to 0.066 per cent.

This illustrates what variations may occur using the same formula, and demonstrates that uniformity can only be obtained by using identical material and the same manipulation. Assay of the finished product seems to be necessary to correct radical variations.

Ninety-two market samples show a range of nitrogen from 0.0018 to 0.539 per cent.; iron, 0.025 to 0.355 per cent.; alcohol, 8.48 to 25.46 per cent.

Some samples contained less than 1/250 of the amount of beef claimed on the label.

ALCOHOL ESTIMATION.

It would be an advantage to have uniform methods for the estimation of alcohol in pharmaceuticals. Extended details covering different combinations have been published by Messrs. Gane and Webster in "Drug Topics for 1909," pages 116 and 117. Dr. Kebler contributes a "Method for Determination of Alcohol in Preparations containing Ether and Chloroform."

"Methods of Determination of Alcohol in Preparations containing Ether and Chloroform":

In preparations containing extractive matter that would tend to form an emulsion with petroleum ether, and that may contain ammonia, ammonium salts or volatile acids, the following method should be used:

25 Cc. of the preparation cooled to 15.6° C. are accurately measured in a flask, carefully calibrated to contain 25 Gms. of distilled water at 15.6° C., and then transferred to a suitable distilling flask. The measuring flask is washed out with water, washings being also transferred to the distilling flask and solution made up to approximately 125 Cc. The solution is then acidified, if alkaline, and distilled, about 100 Cc. of distillate being collected. This distillate is then transferred to a separatory funnel and the flask washed out with 50 Cc. of water. This solution is saturated with common salt, and shaken out with low-boiling petroleum ether (boiling point below 50° C.) until all chloroform or ether is removed from the solution. The solution is then drawn off into a suitable dis-

tilling flask, the petroleum ether washed twice with 25 Cc. of a saturated salt solution, and the washings added to the solution in the flask. The solution is then made alkaline, if acid, redistilled, and 100 Cc. of distillate collected in a flask carefully calibrated at 15.6° C. The distillate is cooled to 15.6° C., made up to 100 Cc., and the specific gravity taken at 15.6° C. with pyonometer. From this specific gravity the per cent. of alcohol in the distillate is obtained from Squibb's table. This per cent. multiplied by four gives the per cent. alcohol by volume in the original preparation. If there is no danger of forming an emulsion by shaking the original preparation with petroleum ether, the first distillation may be dispensed with. If the preparation contains a volatile acid, the solution should be made alkaline before distilling; if it contains ammonia or ammonium salts, it should be made slightly acid. If both ammonium salts and a volatile acid in excess are present, the preparation should be distilled twice as given above.

For preparations containing less than 50 per cent. of alcohol, 50 Cc. of original preparation should be used, and for preparations containing less than 25 per cent. of alcohol, 100 Cc. of original substance should be used for analysis. Alcohol may be determined accurately by this method in all preparations containing volatile substances tha are very soluble in petroleum ether, and slightly soluble in water.

"The distillate should also be read by the immersion refractometer in order to detect the possible presence of methyl alcohol, which is not removed by petroleum ether."

TABLE.

Acetone.

Usually 75 to 80 per cent. distils at 56° to 57° C. It is difficult to obtain above this standard. Scoville.

Acid, Hydrochloric.

One lot contained 0.145 per cent. As_2O_3. Different lots assayed from 29.45 per cent to 35.56 per cent. HCl. Patch.

Acid, Lactic.

Four lots assayed 75.1 per cent. to 77.4 per cent. Scoville.

Acid, Stearic.

Melting point 55.5° to 56.6° C.

For some purposes a purified acid is necessary. Scoville.

Alcohol.

Several hundred samples were from 94.5 to 95.2 per cent. volume. Scoville.

Aloes, Barbadoes.

It is stated by Mr. Geo. Beringer and others that no genuine Barbadoes aloes is obtainable. It is reported that Curacao aloes are sold at an advanced price as Barbadoes.

Ammon. Bromide.

130 samples tested. 102 were standard, 1 was boric acid, 1 contained 18 per cent. ammonio-chloride of mercury, 26 were less than 95 per cent. (Can. Bull. page 143–609).

Ammon. Carbonate.

Does not meet U. S. P. requirements for strength when other tests are met. 91.89 per cent., 93.42 per cent., 94.46 per cent., 94.36 per cent., 96.09 per cent. Patch.

Ammonium Iodide.

Some lots contain over 5 per cent. of potassium iodide. Patch.

Ammonia Water, Stronger.

Difficult to keep of official strength. Freshly opened carboys were 24.2 per cent. to 27.6 per cent. Scoville.

Several carboys assayed over 28 per cent. Patch.

Antimony and Potassium Tartrate.

None found free from arsenic. Patch.

Asafetida.

One lot filled with stones carefully coated with asafetida. Scoville.

Lots offered in N. Y. with only 6 per cent. to 15 per cent. soluble matter. Am. Drug.

Asafetida, powdered.

35 per cent., 39.5 per cent., 37.5 per cent., 38.3 per cent., 40 per cent., 42 per cent., soluble in alcohol. Patch.

Ash.	Alcohol soluble.	
53 per cent.	30.2 per cent.	
37.1 per cent.	38.5 per cent.	
36 per cent.	51 per cent.	Gane.
21.7 per cent.	43.3 per cent.	
28.4 per cent.	47.2 per cent.	L. & F.

Asafetida, whole.

34.7 per cent.	34.1 per cent.	

Asafetida, hard.

26.3 per cent.	45 per cent.	

Asafetida, hard.

34.6 per cent.	39.4 per cent.	

Asafetida, soft.

5.4 per cent.	61.5 per cent.	L. & F.

Balsam Peru.

56.8 per cent. to 58 per cent. cinnamein. Patch.

Samples had sp. gr. 1.13 to 1.51. Cinnamein, 56 to 66.7 per cent. Gane.

Belladonna Leaf.

8 bales assayed 0.30 per cent., 0.29 per cent., 0.38 per cent., 0.30 per cent., 0.42 per cent., 0.34 per cent., 0.36 per cent., 0.25 per cent. The average will not give an extract assaying over 1.2 per cent. The official standard of 1.4 per cent. is too high. Gane.

Belladonna Root.

0.4 per cent., 0.6 per cent., 0.45 per cent., 0.5 per cent., 0.485 per cent. Gane.

Benzin (Petroleum).

Cannot be had of U. S. P. boiling point. 45° to 60° C. unless freshly fractioned. Of a typical lot of 100 Cc. carefully distilled, 50 Cc. came over below 40° C., 30 Cc. between 59.5° and 62° C., 10 Cc. between 62° and 75° C. L. & F.

Benzoin.

The block Sumatra article contains a considerable amount of chips of bark, and will not answer the U. S. P. description of almost completely soluble in alcohol. Aside from this it is of good quality, but this point has caused the rejection of many shipments. Eight lots tested as follows:

Ash.	Alcohol-soluble.	Ash.	Alcohol-soluble.
0.88 per cent.	85.9 per cent.	0.66 per cent.	84.55 per cent.
0.50 per cent.	88.9 per cent.	1.06 per cent.	87.67 per cent.
0.72 per cent.	91.5 per cent.	0.7 per cent.	88.58 per cent.
1.10 per cent.	74.4 per cent.	0.83 per cent.	82.54 per cent.

Bismuth Subgallate.

Six lots assayed 52.5 per cent. to 56 per cent. Bi_2O_3. Patch.

Bismuth Subnitrate.

20 lots assayed from 80 to 81.75 per cent. Bi_2O_3. Patch.

Bloodroot, Acetic Fluidextract.

A wasteful process. Alkaloid not extracted as well as by alcoholic menstruum. Patch.

Calcium Sulphide.

Assayed from 53.5 per cent. to 72.4 per cent. Scoville.

Catechu.

75.7 per cent. to 83.9 per cent. soluble in alcohol. Scoville.

3 per cent. ash and 68 per cent. soluble in alcohol. Patch.

Cherry Laurel Water.

Four lots free from HCN. Three lots had trace only. One lot 0.059 Gm. in 100 Cc. Patch.

Cinnamon, Ceylon.

6 per cent. ash instead of 4 per cent. Patch.

Columbo.

A false root resembling inferior specimens of true root has been found mixed with market lots. It is free from bitterness, does not yield alkaloid, is more reddish in color, and the starch grains are somewhat different. Pharm. Era.

Copaiba.

	Sp. gr.	Resin.	Acid resin.	
Maracaibo.	0.986	66.4	Normal.	
"	1.002	67.5	"	
"	0.995	70	"	
"	0.962	52.5	"	
"	0.980	58.6	"	
"	0.981	67	"	
"	0.963	56.5	"	
Para.	0.962	54.5	Low.	
"	0.956	51	"	
"	0.943	39	"	L. & F.

Cream of Tartar.

Of 37 samples, 1 was sodium bicarbonate, 1 acid phosphate of lime and starch, 1 burnt alum and starch, 15 less than 95 per cent.

Of 93 samples of purified, 21 were 97.5 per cent., 58 less than 92.5 per cent., 1 Rochelle Salt, 1 burnt alum and starch. Lab. Inland Rev. Dep., Ottawa, Can.

Cudbear.

Moisture.	Chlorine. Ash as NaCl.		Arata Dye. Test.	Filtrate from Lead S. S.	Dying on cotton. Alum Mordant.
7.0%	11.7%	1.88	O. K.	Slight pink.	Slight color.
4.8%	42.7%	31.23	"	" "	Colorless.
10.5%	66.8%	59.8	"	" "	Slight color.
4.95%	48.85%	42.4	"	Decided pink.	" "
3%	66.25%	60.7	"	" "	" "
6.7%	4.4%	Trace.	"	Colorless.	Colorless.

Ethyl Nitrite.

Assays 79 per cent. to 89 per cent. Scoville.

Formaldehyde.

Assays 38.7 per cent. to 40.7 per cent. Scoville.

Assays 37.37 per cent. to 40.28 per cent. One lot made milky mixture with water.

Goldenseal.

Assays 3.02 per cent., 2.6 per cent., 2.4 per cent., 2.9 per cent., 2.28 per cent., 2.52 per cent., 3.42 per cent. Patch.

2.64 per cent., 2.9 per cent., 2.6 per cent., 3.33 per cent., 2.13 per cent., 3.3 per cent., 2.4 per cent., 2.46 per cent., 2.46 per cent., 2.8 per cent., 3.05 per cent., 2.47 per

cent., 2.9 per cent., 2.8 per cent. Is frequently mixed with other roots, serpentaria, twin root and stems being common. Gane.

Ipecac.

A false variety of cephaelis, dirty gray brown in color, 0.4 to 1.2 Cm. thick, microscopically resembling the genuine, is reported by Hartwich. The characteristic globular elevations are more pronounced than in the genuine.

Iron and Ammonium Citrate.

17.7 per cent. iron, 20.2 per cent., 17.9 per cent., 18.8 per cent., 17.3 per cent., 18.65 per cent., 18.65 per cent., 18.65 per cent., 19.09 per cent. Patch.

Iron and Potass. Tartrate.

3 lots contained ammonia; three did not. Patch.

Iron Phosphate, Scale.

14.3 per cent. iron, 13.5 per cent., 14.4 per cent., 13.4 per cent.. 12.6 per cent., 12.6 per cent. Patch.

Reduced Iron.

Ten lots assayed from 91.3 per cent., to 96. 2 per cent. iron, but gave excess of sulphide. Patch.

81.2 per cent. to 96.2 per cent. Scoville.

Unless very carefully stored rapidly oxidizes. May lose 15 to 25 per cent. in a month. The U. S. P. allows 10 parts of arsenic per million, while most samples assay fifty parts per million. Gane.

Jalap.

Importations are nearly all immature root, assaying very low. 7.28 per cent., 6.34 per cent., 6.73 per cent., 6.6 per cent., 6.3 per cent., with average of 1.02 per cent. ether-soluble resin. Gane.

Kino.

Shipments offered only 50 per cent. soluble. Am. D.

Lithium Carbonate.

97.2 per cent. to 98.3 per cent. Scoville.

Magnesium Carbonate.

11 lots, 90 to 93 per cent. oxide, 0.4 to 0.7 soluble salts. Patch.

Magnesium Oxide.

	Foreign Soluble Salt in 1 Gm.	Limit of Carb.	Limit of Calcium.	Limit of Iron.	Heavy Metals.	Water of Hydration.	MgO in ignited sample.
No. 1....	0.001	O. K.	O. K.	Trace.	O. K.	9 p. c.	94.06 p. c.
No. 2....	0.001	"	"	"	"	5 p. c.	94.67 p. c.
No. 3....	0.001	"	"	"	"	—	96.74 p. c.
No. 4....	0.001	"	"	"	"	—	97.74 p. c.

Patch.

Can easily be had of U. S. P. purity, but will not answer hydration test. One part with 15 of water requires to stand more than half an hour. Light, fresh samples gelatinize quicker than old, heavy samples. Often if well rubbed down in mortar before adding water it will gelatinize quicker. Gane.

Magnesium Sulphate, Dried.

Traces of chlorides. Assays 80.8 per cent. anhydrous, 69.6 per cent., 77.5 per cent. Patch.

Menthol.

A lot of dark, camphor-looking substance offered as crude menthol proved to consist entirely of borneol camphor. Gane.

Milk Sugar.

Commercial milk sugar digested with dilute alcohol leaves more than the 0.03 Gm. residue from 1 Gm. as allowed in U. S. P.

Five lots gave: 0.271, 0.2761, 0.258, 0.3485, 0.30 Gms.

The fermentation test, or Leffman's oil of sesame test, are better for showing as low as 1 per cent. of cane sugar. Gane.

Myrrh.

36.9 per cent. to 44.7 per cent. soluble in alcohol.

Nux Vomica.

1.268 per cent. strychnine. 1.221, 1.2, 0.953, 1.23, 0.95, 1.2, 1.21, 1.3, 1.26, 1.25. Patch.

Oil of Anise.

Optical rotation: 0.5° + 0.4° + 0.4° — 0.6 + 0.3°.

Other tests O. K. (U. S. P.—Lævogyrate to — 2°.) Patch.

Oil of Bergamot.

Two lots contained alcohol in small amounts, probably added as a preservative. Gane.

Oil of Cajuput.

Sp. gr.	Rotation.	Copper.	Cineol.	
0.913	— 2° 2′	Present.	70 per cent.	
0.915	+ 0° 5′	"	35 "	
0.917	— 3° 25′	"	52 "	Gane.
0.917	— 2°	None.	55 "	Patch.

Oil of Cassia.

Sp. gr.	Rotation.	Lead.	Cinnamic Aldehyde.	
1.0606	———	Absent.	70 per cent.	
1.0534	———	"	80 "	
1.0542	— 0.4°	"	78 "	Patch.

Several lots ran so close to official limits in cinnamic aldehyde, as to cause suspicion that it is systematically treated. Scoville.

Ten lots sp. gr. 1.048 to 1.066, aldehyde 70 per cent. to 82 per cent. (8 above 75 per cent.), lead present in all. Resin in two, petroleum in two. 8 soluble in 70 per cent. alcohol, 2 not. Gane.

Oil, Castor.

Varies considerably in color, odor and taste. Scoville.

Oil of Cinnamon, Ceylon.

Quoted at $6.00 per lb., $6.00, $7.00. $7.50, $7.50, $9.50, $14.00, $22.00.

One dealer claims that all sold below $14.00 are imitation products, not distilled from Ceylon cinnamon bark but from mixtures of oils.

Other manufacturers of high reputation guarantee their products at $7.50 to be a pure distillate from Ceylon cinnamon bark.

Oil of Citronella.

Purer than formerly. One lot contained a fatty oil. Gane.

Oil of Clove.

Nine lots, sp. gr. 1.041 to 1.0454, eugenol, 81.5 per cent. to 87 per cent. Patch.

Oil of Copaiba.

Much on the market is a mixture of oil of African copaiba and oil of gurjun balsam. Parry.

Of five samples, two contained African oil, one gurjun oil. Rotation —9° to +42°. Gane.

Oil of Eucalyptus.

Sp. gr.	Opt. Rotation.	Cineol.	Soluble in 70 per. cent. alcohol.	
0.917	—1.9°	70 per cent.	1–3	
0.917	+1.°	70 " "	1–3	
0.917	+0.5°	70 " "	1–3	
0.926	+0.5°	65 " "	1–3	Patch.

Five lots, sp. gr. 0.908 to 0.917. Rotation 1° 3′ to 5°, cineol 36 per cent. to 75 per cent. The sample assaying 36 per cent. cineol had a large amount of phellandrene. Gane.

Oil of Fennel.

Sp. gr.	Congealing point.	Sol. in 92 per cent. alcohol.	Sol. in 80 per cent. alcohol.
0.959	5° C.	1–1	1–10
0.9634	5.5° C.	1–1	1–8
0.964	6° C.	1–1	1–10
0.902	—	—	insol. { rejected; at 16° C. not solid.
0.950	3° C.	—	—
0.964	5.5° C.	1–1	1–10
0.965	6.5° C.	1–1	1–10 Patch.

Specific Gravity.	Congealing Point.	Rotation.
0.958	— 11° C.	+ 32° 36′
0.966	0.5° C.	+ 14° 30′
0.9581	— 3° C.	+ 23° 35′
0.9665	3.5° C.	+ 1° 44′
0.9618	0.5° C.	+ 11° 16′
0.9762	— 2.5° C.	+ 9° 47′
0.9613	4° C.	+ 14° 42′
0.9658	2° C.	+ 14° 26′
0.9641	4° C.	+ 14° 19′
0.9584	2° C.	+ 19° 9′

Samples from eight dealers. All soluble in 80 per cent. alcohol. Some slightly opalescent. Gane.

Oil of Juniper Berries.

Four lots, sp. gr. 0.854 to 0.862, all insoluble in ten volumes of 99 per cent. alcohol. Is often mixed with turpentine. Gane.

Oil of Lavender Flowers.

Very inferior grades are being offered. Some is sophisticated with heavy oil of camphor, as sample No. 3 below.

	Sp. gr.	Rotation.	Linalool.	
1.....	0.896	— 5°	31.94 per cent.	
2.....	0.890	— 5° 75′	28.77 "	
3.....	0.913	+ 1	22.63 "	Gane.

Oil of Lemon.

The difficulty of obtaining a full 4° citral content continues. We are obliged to accept some oils below this standard. Scoville.

Is sometimes adulterated with turpentine and sometimes with alcohol. Stallman.

Of seven samples, two contained turpentine, one as much as 33 per cent. Official method of determining citral is of doubtful practicability. (L. & F.)

Five samples.	Sp. gr.	Rotation.	Citral approx.	
	0.8535	+ 59°	4 per cent.	
	0.8511	+ 61° 25′	4 "	
	0.8510	+ 59°	4 "	
	0.8530	+ 59° 25′	4 "	
	0.849	+ 54° 25′	3.5 "	contained 10 p. c. alcohol. Gane.

Oil of Lemongrass.

Citronella oil is still substituted for oil of lemongrass. A good lemongrass oil should

run about 70 per cent. aldehyde. Sample sold as lemongrass had rotation —4° 5′, sp. gr. 0.892; aldehyde 10 per cent. agreeing closely with citronella. Gane.

Oil of Origanum.

Mostly compounded and so labeled, are mixtures of turpentine and other products. Some houses claim that oil thyme is always sold as pure oil origanum. A lot guaranteed to be distilled from origanum vulgare was of reddish color, sp. gr. 0.910; at 25° C. soluble in one half volume of alcohol and one volume of 80 per cent. alcohol and assayed 30 per cent. phenols. Patch '09.

Oil, Olive.

One third of the samples examined by the State Board of Health consisted of from 50 per cent. to 100 per cent. cottonseed oil. Patch.

Oil, Peanut.

One lot contained cottonseed oil, another cottonseed oil and oil of benne. Patch.

Oil of Pennyroyal.

Seven lots.

Rotation.	Sp. Gr.	Sol. 70 per cent.
+ 32°	0.9225	1–2 vol. rejected.
+ 14.4°	0.9205	" "
+ 19.9°	0.9200	"
+ 22°	0.9224	"
+ 21°	0.9200	"
+ 14.4°	0.9206	" "
+ 20.5°	0.9316	"

Some rejected because it failed to react with any of the official tests. Scoville.

Eleven samples from eight dealers. Sp. gr. 0.9134 to 0.9340 optical rotation, + 10° 37′ to + 31° 33′. Two lots insoluble in 9 volumes of 70 per cent. alcohol, one insoluble in 5 volumes, only two U. S. P. L. & F.

Oil of Peppermint.

Carefully distilled oil shows traces of sulphur compounds although meeting all other official requirements. L. & F. The amount of ester present will vary according to state of development of plants when distilled. If inflorescence is well developed the ester contents will be high. Of late years the sp. gr. of natural oil has lowered and menthol contents diminished.

Sixteen samples ranged in sp. gr. from 0.895 to 0.9076. Rotation —21° to —28° 5′, ester 4.69 per cent. to 9 per cent., menthol 50.2 per cent. to 62 per cent. Six were soluble, 1 in 3 of 70 per cent. alcohol, 10 in 1–4. Redistilled ranged in sp. gr. from 0.902 to 0.908. Rotation —23° to —28° 25′, ester 7.4 per cent. to 9.13 per cent., menthol 59 per cent. to 66.75 per cent. 3 soluble one in three in 70 per cent. alcohol, 2, one in four. Gane.

Oil of Rosemary.

In a former report we stated that pure oil may be either right or left rotary. Further investigation confirms this statement. Thirteen samples from leading dealers had a sp. gr. of 0.894 to 0.906, Rotation —4° to +12° 5′. Bornyl acetate 1.7 per cent. to 5.5 per cent. (8 below 3 per cent.) Total borneol 8 per cent. to 15.4 per cent. (8 below 12 per cent.), 9 soluble in 80 per cent. alcohol, 4 insoluble. Gane.

Oil of Sandal.

West Indian oil from Amyris balsamifera, a Venezuelan tree, has a lower gravity than E. I. oil; is right rotary, is apt to be thick and viscid and is insoluble in 50 volumes of alcohol. Sp. gr. 0.955. Rotation about + 17°. Amyrol, corresponding to santalol, 30 to 50 per cent. Gane.

Oil of Sandal, E. I.

Ten samples from leading dealers ranged in sp. gr. from 0.916 to 0.977. Rotation

—16° to—17°, santalol 90 to 95 per cent.; one sample yielding 90 per cent. santalol was insoluble in 20 volumes of 70 per cent. alcohol and apparently had been reduced with cedar wood oil. Gane.

Oil of Sassafras.

Is still sometimes mixed with heavy oil of camphor and with so-called artificial oil of sassafras, which is simply a fraction of camphor oil. Three lots had sp. gr. 1.065 to 1.072. Rotation +3° to +3° 75′. All soluble in 90 per cent. alcohol. Gane.

Oil of Spearmint.

One sample contained oil peppermint. L. & F.

Several samples contained oil peppermint, one kerosene.

Five samples tested as follows:

Sp. G.	Rotation.	Sol. in 80 per cent. alcohol.
0.9277	—47°	1 in 1
0.9240	—39° 25′	"
0.9230	—43° 30′	"
0.882	—47°	insoluble, rejected.
0.9038	—21° 50′	" " Gane.

Oil of Tar.

Much that is offered is tar and not distilled oil of tar. L. & F.

Oil of Thyme.

Colorless, good odor, soluble in 10 volumes of 80 per cent. alcohol. Rotation, —1.4°; phenols, 20 per cent. Patch.

Oil of Wormseed.

Two varieties of genuine oil in the market. Maryland pot distilled, of high gravity and ready solubility; and Western, steam-distilled, of lower gravity, less solubility.

Ten lots ranged, sp. gr. 0.955 to 0.977; rotation, —4° 15′ to +51°. Solubility in 70 per cent. alcohol from 1–3 to 1–7. Gane.

Oleoresin of Capsicum.

One lot dark greenish brown color, thick, semi-solid mass; 1 Cc. kept at 100° C. for 8 hours weighed 0.84 Gm.

One lot very weak in taste. Residue from 1 Cc., 0.435, nearly dry, little oil present. Rejected. Patch.

Oleoresin of Cubeb.

1 Cc. evaporated 8 hours gave 0.4 residue, 0.29, 0.21, 0.20, 0.43, 0.38, 0.38, 0.34, 0.35. Patch.

Podophyllin.

Considerable variations from official standard still found.

Ash.	Alcohol sol.	Water sol.	Ether sol.	Chloroform sol.
0.70	98.9	42.3	51.6	58.8
1.35	95	20	80	66
0.40	99	—	72	67
1.00	96	20	68	63
1.00	99	—	81.5	63 Gane.
1.00	99.2		82	65
2.00	89.4		75.6	56
1.5	94.6		80	63.2
0.6	99.5		—	—
0.5	99.3		72	62.4
2.00	90		—	—
1.2	94.8		—	—
1.4	95.2		—	— Patch.

Potassa, Caustic.

81.6 per cent. to 90.08 per cent. Scoville.

Potassium Carbonate.

98.3 per cent. to 98.52 per cent. One lot, 0.4 per cent. KCl. Patch.

Quince Seed.

Contained 33 per cent. foreign material—bark, stone, charcoal, etc. Patch.

Seidlitz Mixture.

3 lots gave 23.36 per cent., 27.1 per cent., and 28.6 per cent. sodium bicarbonate. Gane.

Senna.

Contains a large amount of ash. Tinnevelly from 10 per cent. to 14.5 per cent. One lot of Alexandria, 15.5 per cent. Gane.

Soap, Soft.

Much in the market is objectionable owing to frequent high alkalinity. Assays run as follows:

	Free alkali. K_2CO_3.	Free alkali. KOH.		Free alkali. K_2CO_3.	Free alkali. KOH.	
No. 1.	0.892	0.12	No. 16.	2.39	0.00	
No. 2.	0.696	0.12	No. 17.	1.15	0.055	
No. 3.	0.645	0.10	No. 18.	1.29	0.078	
No. 4.	0.838	0.00	No. 19.	0.92	0.00	
No. 5.	0.714	0.223	No. 20.	0.64	0.00	
No. 6.	0.662	0.330	No. 21.	1.15	0.10	
No. 7.	0.261	0.145	No. 22.	0.412	0.00	
No. 8.	0.688	0.066	No. 23.	1.67	0.00	
No. 9.	0.470	0.022	No. 24.	0.97	0.00	
No. 10.	0.137	0.000	No. 25.	0.55	0.00	
No. 11.	1.590	0.000	No. 26.	0.117	0.00	from corn oil.
No. 12.	2.196	0.000	No. 27.	0.212	0.00	from linseed oil.
No. 13.	1.590	0.000	No. 28.	0.200	0.00	from linseed oil.
No. 14.	1.960	0.000	No. 29.	0.300	0.00	from linseed oil.
No. 15.	2.35	0.000	No. 30.	1.100	0.12	from linseed oil.

Gane.

Soap Powder, Castile.

One lot rejected; contained animal fats. Patch.

Sodium Hydroxide.

89.3 per cent. to 90.77 per cent. Scoville.

Sodium Carbonate, dried.

77.93 per cent., 96.09 per cent. Patch.

Sodium Sulphate, purified, dried.

87.8 per cent., 99.9 per cent., 99.8 per cent., 99.9 per cent. Patch.

Spirit of Camphor.

A sample condemned as containing only 7.5 per cent. of camphor was found to yield 9.26 per cent. by both the salt benzol and the optical methods and a freshly prepared sample strictly official, gave 9.8 per cent. by same method.

Thymol Iodide.

Varies greatly in quality. Five lots from different sources assay as follows:

Chlorine.	Ash.	Ether insol.	Metal impurities	Apparent Iodine content.
4.6	2.4 per cent.	3.77 per cent.	K.Ca.Fe	44.6
1.8	2.8 per cent.	4 per cent.	K.Al.Fe.	45.9
8.01	0.4 per cent.	0.5 per cent.	Fe.	54
None.	1.7 per cent.	3.025 per cent.	Ca.Al.Fe.	44.6
0.17	0.5 per cent.	5.6 per cent.	K.Fe.	44.22

Actual Iodine.	Inorganic Iodine.	Iodine Combined with Thymol.	Thymol Iodide.
28.14	0.67	27.47	59.61
30.44	1.5	37.94	82.33
25.36	0.92	24.44	53.04
44.6	1.85	42.75	92.47
43.61	3.65	39.96	86.71

Turmeric, Powdered.

Adulterated with product artificially colored with aniline dye. Pearson, '09.

Whiskey.

Three samples contained distinct traces of copper; about 25 parts per million. Gane.

Zinc Oxide.

While assaying, the official per cent. of oxide may contain lead, antimony, and excess of chloride, making the product irritating. Samples assaying 98.6, 99.1, 98.8 and 98.2 of zinc oxide were rejected on account of impurities named.

Zingiber, Jamaica.

Alcoholic extract 3.7 per cent., 6 per cent., 6.2 per cent., 4.4 per cent., 6.1 per cent., 5.6 per cent., 4.5 per cent., 5.3 per cent., 4.4 per cent. Patch.

The Chair stated that the Section had before it a very full program, with but limited time for its consideration, but it had been his intention that an hour and a half should be devoted to a consideration of the report just submitted, and to its allied subjects, but some of the people who were to present these subjects had not yet arrived, having gotten a late start. There was a rule or precedent that communications or papers other than committee reports should not exceed fifteen minutes in the presentation, and that discussion by any one member should not exceed five minutes; he thought if the members would confine themselves to that limit, the Section could get through a great deal of business. As bearing on the same general subject, he said he would now call on Mr. Schneider, of San Francisco, to present his paper on "The Quality and Purity of Drugs on the Pacific Coast," after which discussion might be had.

Mr. Schneider presented his paper as follows:

THE DRUG SITUATION ON THE PACIFIC COAST.

BY ALBERT SCHNEIDER.

The Pacific Coast and Rocky Mountain States form a large country distinct from the rest of the United States. Distinct in topography and climate and in the customs and habits of its inhabitants. In fact there are several distinct sub-countries within this vast area. Ambassador Bryce, of England, recently called attention to the fact that California presented the characteristics of a distinct country. The contrasts between the East and the West of the United States are no doubt fully apparent to those of our eastern friends who have made the Pacific Coast a visit.

These differences exist in things pharmaceutical also, and it was this that prompted the organization of the Pacific Pharmaceutical Association, which, we hope, will bring together the pharmaceutical interests in this

area, and suitably combine them with those of the A. Ph. A. Without further preliminaries we shall briefly outline the drug situation as it exists on the Pacific Coast.

First of all, let us briefly consider the drug imports on the Pacific Coast. The writer's experience and observations are limited to the port of San Francisco, but since this is the most important port of entry on this coast, it is in all probability not far amiss to state that the conditions are similar at the other ports and sub-ports.

The chief importing countries are Japan, China, British India, South America, Mexico and Central America, Canada, France, England, Germany, Italy, Spain, Australia, Austria, Portugal, Belgium, Denmark and Sweden, Greece, Dutch East India, Straits Settlements, and our Philippine Islands, about in the order named. Japan is, however, far in the lead of all other countries.

The following are the classes or groups of drugs presented for entry at the port of San Francisco:

1. *Chinese Drugs.*—These constitute the great bulk of the drugs imported at San Francisco. Their nature has been more fully explained in another paper. Chinese drugs are also imported at Seattle and at Los Angeles, though in much smaller quantities.

2. *Japanese Drugs.*—These are mostly of a patent or proprietary nature. Some are labeled in conformity with the United States Pure Drugs Act and some are not. They include liquids, pills, tablets, powders, and a few crude drugs. Many of the labels are gross exaggerations of therapeutic virtues ascribed to these remedies.

3. *Drugs and Chemicals other than Chinese and Japanese.*—A variety of drugs and chemicals are imported from other countries as England, Italy, France, Germany, South America, Mexico, India and Spain. Among the drugs imported from these countries are alum, barium and other salts, camphor, calomel, sulphur, logwood, quebracho, aloes, glycerin, wax, spices, vanilla, medicated liquors, crude vegetable drugs, tablets, proprietaries, pills, etc. These are presented for entry in irregular lots and not as regular drug consignments, as a rule. Occasionally a large consignment of some drug is presented at one of the ports, as cinchona at the port of Los Angeles.

In order to safeguard the drug interests of the entire United States all drugs presented for entry at any and all of the ports on the Pacific Coast should be properly inspected. If this is not done it will be only a question of time when attempts will be made to bring in via the Pacific Ports drugs rejected at the Eastern Ports. Furthermore it would be possible to bring in worthless drugs via the Eastern Ports by simply shipping them I. D. (Immediate Delivery), of course subject to inspection at the port of final destination, provided any inspection is made. Prior to the inspection of Chinese drugs at the port of San Francisco large quantities of in-

ferior and worthless teas (old leaves, exhausted leaves, stems, etc.), were entered with the medicines, labeled medicinal leaves." Certain of the Chinese drugs do not require close inspection as it is only too evident that they will never get into the American trade, as for example, lizards, snakes, snake skins, centipedes, scorpions, sea slugs, bones and teeth of animals, sinews of deer and cow, etc. There are a number of Chinese remedies which are of such a nauseous nature that they should not be permitted entry as they may be the cause of developing skin diseases, intestinal diseases including Asiatic cholera and perhaps the bubonic plague.

Incidentally it may be mentioned that Chinese pharmacy and medicine on the Pacific Coast are apparently without legal restrictions. It is true the great majority of Chinese doctors limit their practices to their countrymen but some of them seek to get patronage among Americans, as is evidenced by the fact that they advertise in the daily papers. Conditions are said to be especially bad in Los Angeles. It may be stated that the advertising Chinese doctors are of the better class considered from the Chinese viewpoint. Judged according to our standard they are mere charlatans. It is also a fact that most of their patients are women. I am certain that not one of these patients would ever take another dose of Chinese medicine if they were informed as to the disgustingly nauseous substances which they may contain, either in pill form, powder or infusion. Lucky indeed if these deluded patients do not acquire one or the other of the diseases above mentioned, along with the medicine taken. It is up to the State authorities (State Board of Health, State Board of Medicine and State Board of Pharmacy) to see to it that Chinese pharmacy and medicine conform to the laws of the state.

Wholesale drug dealers, as well as retail pharmacists, of the Pacific Coast express themselves as being well pleased with the Federal Pure Drugs Act, and they are confident that it will have a most beneficent influence. Some have declared themselves quite emphatically regarding the two drug standards, the United States Pharmacopœia and the National Formulary. The criticisms may be summarized as follows:

1. Only the U. S. P. should be recognized as the standard of purity and quality of drugs. The N. F. is considered a very unreliable offshoot, or overflow product, of the U. S. P.

(b) The U. S. P. standards require revision along the lines of simplification of methods and a moderation (lowering) of same quality and purity requirements.

(c) The U. S. P. methods of assay are beyond the ability and equipment of the average retail druggist.

2. The criticism of the Federal Pure Drugs Act also applies to the California Pure Drug Law. Some retail dealers object to the regulation governing the sale of phenol, declaring that since this article is a very valuable, simple, and much used general antiseptic, its sale and use should

not be in any wise hindered or restricted. The belief is expressed by many that the phenol law will not materially reduce accidental or suicidal poisoning through this agent.

3. As near as can be ascertained, wholesale drug dealers import very few drugs directly. They declare that should they use large quantities of drugs it would be profitable to import direct. From this it would appear that the direct importations (via the Pacific ports) will gradually increase with the increase in demand for drugs on the Pacific Coast.

The present methods of wholesale dealers may be summarized as follows:

(a) Dealing directly with Eastern (New York City very largely) drug importers.

(b) Dealing through one or more Eastern drug brokers. Usually the work is left to one broker, who makes all purchases for the wholesale house.

(c) The wholesale houses do not have their own purchasing agents on the ground in the East, as is common with Eastern wholesale drug houses. They rely wholly upon the honesty and integrity of the Eastern importers and brokers, nor are they likely to be correctly informed regarding the vicissitudes of the drug market and drug resources or of the ins and outs of drug pooling as practiced by the brokers.

4. As a very general thing, none of the wholesale or retail dealers of the Pacific coast test the drugs which they receive as to quality and purity. They rely wholly upon the guarantees furnished to keep them out of legal trouble. Several wholesale houses have made partial and periodic examinations of their drugs, but the work has not been consistently continued.

5. Reliable dealers have little information to give regarding contraband drugs and chemicals. Opium and morphine are smuggled in on the person in small packages secreted in luggage. Tramp steamers and certain small steamers are reported to convey contraband drugs.

6. Wholesale, as well as retail dealers, have no explanation to offer as to how the drugs in their possession are adulterated, excepting that they unanimously shift the responsibility on the guarantor, that is, the retailer blames the wholesaler and the wholesaler blames the eastern brokers and importers. Based upon the data secured as state drug inspector, and as micro-analyst in the state as well as state laboratory, the following is perhaps the explanation in accord with facts.

a. Some of the drugs found to be adulterated are old, that is, they have been in possession prior to the federal and state enactments. It being presumed that sophistication was made common prior to the pure drugs law.

b. Since the wholesale dealers have no buyers on the ground to carefully inspect the drugs prior to purchase, and since they depend wholly upon the honesty and capability of the eastern brokers and importers, it is

most probable that the more remote wholesale houses (as those on the Pacific coast), do not always get the first quality drugs, as has been set forth elsewhere. (Pacific Pharm., *2*, 388–393, 1909.)

c. Wholesale dealers constantly deny that they handle a first and second quality or grade of drugs although it is known that this is often the case. This is true also of importers and we are justified in concluding that Eastern brokers and importers do not always send a first quality drug even though it may be ordered and paid for.

The above are in all probability the correct explanations as to why adulterated drugs are more prevalent on the Pacific Coast.

7. Wholesale as well as retail dealers state that it is too early to note any effects due to the new opium law. The opinion is expressed that smuggling of opium will no doubt become extensive as soon as the present supply of smoking opium is exhausted.

8. Anti-opium remedies in pill and tablet form are imported in large quantities from China and Japan. Some of these have been analyzed in the State laboratory (at Berkeley, California) and found to contain a high percentage of morphine. It is probable that some of these remedies so-called are really intended for habitual opium users.

9. Some retail druggists of San Francisco declare that some women take camphor habitually in order to improve the complexion and perhaps also as a nerve sedative. It is stated that many Chinese use the granulated camphor habitually. Further inquiry along this line is necessary. It is also a fact that many of the Chinese pills and plasters contain camphor. It is certainly advisable to consider camphor as a likely habit-forming drug.

10. Certain coal-tar derivatives of German manufacture identical with the American copyrighted article phenacetin (Copyright by Schieffelin Co.), and similar products, are imported *via* Canada. They are imported under the chemical names only in order to evade the copyright held by Schieffelin & Co. The entire business is carried on by mail only and the local agents are constantly changing name and office location in order to escape the agents of Schieffelin who are prosecuting them whenever possible. This matter is causing much trouble and should be corrected. It would appear that the matter has been tested repeatedly in court and that the claims of the parties holding the copyright have in all instances been sustained.

11. The principal habit-forming drugs on the Pacific Coast are opium and opium derivatives, chloral hydrate, bromides, coal-tar sedatives and cocaine.

12. The great majority of better class pharmacists and physicians deplore the percentage evil. This is a matter of state legislation.

13. No definite information could be obtained on the importation, use and sale of mescal buttons. It is highly probable that such information could be obtained in southern California, New Mexico and Arizona.

14. All are agreed that the pure-drug laws, federal and state, have compelled an average raise of 10 per cent. on drug articles. This was naturally to be expected and no serious objections have been raised on that account.

15. Wholesale dealers complain of the frequent changes in Federal decisions, particularly as to labeling requirements, and others, which they declare lack clearness. There is also considerable uncertainty as to what constitutes misbranding or mislabeling. The wholesale as well as retail dealers have had much trouble in relabeling their articles in conformity with the Pure Drugs Act. All are hopeful that no further serious difficulties will arise.

Based upon the existing conditions on the Pacific Coast, it is evident that the interstate inspection and examination of drugs is even more important than the inspection of the drug imports. This interstate and port inspection of drugs must be in charge of those who are familiar with drugs and pharmaceuticals. Based upon observations made, it would seem most desirable to have food and drug laboratories, state as well as federal, entirely distinct.

The Chair stated that these two communications were before the Section for discussion. He noted the presence of a number of government officials, state inspectors and others, who no doubt had authoritative data sufficient to keep the members listening all day, if time permitted. He called attention to a communication that had been received from a member of a State Board of Pharmacy on this particular subject—a paper entitled "How Much Deviation from Legal Standards for Assayed Products Should be Allowed by Boards of Pharmacy?" This communication came from the State of Pennsylvania, and brought up a very interesting question as to variance in assays of extract nux vomica and fluidextract of belladonna leaves, the former varying all the way from 4.32 Gm. of strychnine to 7.20 in 100 Gm., and the latter from 0.25 Gm. of mydriatic alkaloids to 0.39 in 100 Cc., the table presented by the writer showing a variation in the extract of nux vomica of from 13 per cent. below standard to 44 per cent. above, and in the fluidextract of belladonna leaves of from 16 per cent. below to 30 per cent. above. The thing that perplexes this particular Board is, how far the Boards of Pharmacy should go in enforcing the law. He believed this would be an excellent subject for discussion at the next annual meeting, and if there was no objection this paper would be read by title only and referred for publication in the Proceedings, in the hope that it would serve as a suggestion for a series of communications for next year.

HOW MUCH DEVIATION FROM LEGAL STANDARDS FOR ASSAYED PRODUCTS SHOULD BE ALLOWED BY BOARDS OF PHARMACY?

BY CHRISTOPHER KOCH.

An important question now confronting boards of pharmacy in the various states is to have some basis upon which to base prosecutions on assayed products. The writer believes that all boards will agree that absolute conformity with the standard is unattainable and that some deviation, either above or below, must be allowed.

In order to get some idea of present conditions, the State Pharmaceutical Examining Board of Pennsylvania collected samples of extract of nux vomica and fluidextract of belladonna leaves from the nine largest manufacturing pharmacists of the United States. Extract of nux vomica was selected, because of its common and frequent use in preparing the tincture, and we anticipated very little deviation. Fluidextract of belladonna leaves was selected because it was not official and not so commonly used. However, it is generally used to prepare the U. S. P. tincture of belladonna leaves, which is one of the assayed tinctures. The label upon every sample bore the statement that the product was standardized to assay 0.3 Gm. of mydriatic alkaloids, and in each case gave a formula for preparing the U. S. P. tincture.

The extract of nux vomica was assayed in accordance with the U. S. P. process. The belladonna was assayed according to Puckner's method. All samples were assayed at the same time, with the same material and in duplicate.

The following table gives the results:

Sample.	*Ext. Nux Vom.* Gm. of strychnine in 100 Gm.	*Sample.*	*Fldext. Belladon. Lvs.* Gm. of mydriatic alkaloids in 100 Cc.
A	4.32 Gm.	H	0.25 Gm.
B	4.51 "	B	0.263 "
C	4.55 "	G	0.264 "
D	4.83 "	I	0.27 "
E	4.90 "	A	0.28 "
F	5.12 "	E	0.29 "
G	5.40 "	D	0.306 "
H	5.60 "	C	0.33 "
I	7.20 "	F	0.39 "

This table shows a variation in extract of nux vomica from 13 per cent. below standard to 44 per cent. above; in fluidextract of belladonna leaves from 16 per cent. below to 30 per cent. above.

That this is far too much deviation, no one will deny. That the standard is not unattainable, is proven by the fact that several of the samples are practically as stated on the label and in the U. S. P.

In the opinion of one of our ablest pharmaceutical chemists a variation

of 4 per cent. or 4.80 to 5.20 Gm. in extract of nux vomica, and 10 per cent. or 0.27 to 0.33 Gm. in fluidextract of belladonna leaves would be fair. Another very able chemist states that 5 per cent. or 4.75 to 5.25 Gm. in extract of nux vomica and 6¼ per cent. or 0.28 to 0.32 Gm. in fluidextract of belladonna leaves would be the proper deviation. Under the first opinion, we would have three (3) nux and five (5) belladonna samples that would pass inspection. Under the other opinion we would have three (3) nux and three (3) belladonna samples O. K. It is the opinion of the writer that the combination of the extremes of these chemists would certainly be a fair average, namely 5 per cent. for extract of nux vomica and 10 per cent. for fluidextract of belladonna leaves. The label should tell the whole truth, which certainly is not the case if the product varies beyond these points.

It is inconceivable how any chemist could err from 16 per cent. below to 44 per cent. above, on a simple drug assay, and one is almost forced to believe that no assays were made in these cases. (The small number of chemists employed by some of the leading manufacturers would tend to strengthen this belief.) Such large deviations will not only tend to discredit the manufacturers' claims for superiority in this field, but will react against the whole subject of standardization.

A maximum dose of extract of nux vomica assaying 7.20 Gm. of alkaloid, administered to an anæmic patient, might prove fatal. We know it is far more dangerous to take an overdose than it would be to take a drug which has been weakened by adulteration. Why should not such a case be treated in like manner?

Philadelphia, Aug. 14, 1909.

Mr. Rusby said that he could not let pass unchallenged the statement made or implied in the paper just presented that unadulterated belladonna leaves do not come up to the required standard of strength. The experience in his laboratory had been that they almost never failed to do so, and he regarded this position as not well founded. It is true that in some lots where the leaves are broken up they will be found adulterated with small particles of chopped-up chestnut leaves, or some similar substance, ingeniously worked in and concealed, and of course this reduces the alkaloidal percentage. He had had bales of such belladonna leaves containing small amounts of chestnut leaves, and he was inclined to believe the shippers of these things sometimes adulterated them up to, say, five per cent., just to see if they will stand the test—just as one puts his foot on the ice to see if it will bear his weight. So this accounts for the fact that belladonna leaves do not always come up to the standard of alkaloidal strength. Mr. Rusby said he would not like the impression to go abroad from this Association that pure belladonna leaves have failed to come up to the standard, for it was not true; and he did not think the standard was at all too high.

The Chair stated that, without objection, the paper would be received and referred for publication, as a contribution to the literature of the Section, and it was so ordered.

The Chair then invited Mr. James G. Steele, of San Francisco, an old and honored member of the Association, to address the Section upon the conditions of the drug market on the Pacific Coast.

Mr. Steele began by saying that it might perhaps be of passing interest to the members to know that twenty-five years ago he was appointed Chairman of the Committee on Drug Market of the American Pharmaceutical Association, and took a great deal of pains and spent much time in getting up his report, which was quite a voluminous one.

As to imports into the port of San Francisco, Mr. Steele said they were varied in extent and quantity, importing as they did from all parts of the vast Pacific Ocean and the countries bordering thereon. From the Sandwich Islands we have the arva or taro root, from which the well-known "poi" is made, as also a distinct and delicately flavored coffee known as "kona." From the South Sea Islands there comes also the arva root, likewise copra, dried orange and lemon peel, guava, cocoanuts, and dried fish. From South America we have cinchona and Winter's bark, crude quinine, coca leaves, extract of coca and cocaine—in fact, many barks and leaves of medicinal quality and value. But coca leaves are very delicate, and do not bear ocean transportation well, and so the chemists of South America, in the countries where the coca tree grows, have formulated a plan of making a liquid extract, which they send to New York, to be made into cocaine and its allied substances. South America also supplies us with nitrate of soda, for the manufacture of fertilizers. From Brazil, in that section of the world, we have coffee and gutta-percha and rubber, and quite a variety of medicinal dried drugs. From the Argentine Republic and contiguous countries come extract of beef, beef-marrow, suet, and maté or Paraguay tea. From Japan we have teas, mattings, carvings and curios, while from the countries further south and west we import cinnamon, cassia, cinchona barks, sulphate of quinine, nux vomica beans, asafetida, ginger root, capsicum, etc. From China we have teas, dried fruits and dried roots of various sorts, Tonquin musk and many essential oils, such as oil of cinnamon, cassia, etc. Mr. Steele remarked that in the southern part of California various experiments were being made to dry and market orange and lemon peel. From the Central American Republics we have coffee and the cacao-bean for the making of chocolate. The Isthmian region also supplies us with cedron beans, nux vomica and cacao-beans in large quantities. Mexico sends us the vanilla bean (largely the best produced), sarsaparilla, jalap roots, nux vomica beans, damiana leaves and coffee—the latter, with cacao-beans, in large quantities. Mexico also furnishes us with mahogany and other fine woods. From Alaska on the north come fur-seal skins and gold, while from British

Columbia comes the oalachon fish, with its expressed oil, once heralded as a substitute for codliver oil. From Siberia come large amounts of fossil ivory and pods of musk from the Siberian deer. Australia supplies us with dried eucalyptus leaves, eucalyptus oils and various woods. Far-away India sends us vast quantities of jute, and from the countries in that part of the world we get our silks, both raw and manufactured.

Mr. Steele said they were fortunate in having as drug examiner at San Francisco Mr. John W. Dawson, a gentleman of varied attainments and unimpeachable integrity, and associated with him was Prof. William T. Wenzell, emeritus professor of chemistry in the California College of Pharmacy, who made the necessary analyses by Government rules and regulations.

The Chair stated that the Section was fortunate in having present this morning a gentleman who had a tremendous fund of information on the drug-market of the country, and he would call on him to further discuss this interesting subject. He referred to Mr. Lyman F. Kebler, of the Drug Laboratory, at Washington, D. C.

Mr. Kebler began by saying that Mr. Patch's report, supplemented by the remarks of Mr. Rusby, only touched the surface of the real situation. He said that inasmuch as this was virtually a Pacific Coast meeting of the American Pharmaceutical Association, he wanted to talk just a few moments upon the Pacific Coast situation. In fact, he had made it a business to come to the Coast for that specific purpose. He had entered this part of the country at Spokane about three weeks ago, and had been gradually working his way south ever since. He had spent about a week in Seattle. The conditions pertaining to Chinese and Japanese drugs as described by Mr. Schneider in his paper were virtually duplicated in Seattle. The Chinese status was, however, a little more prominent, for the Japanese are beginning to assimilate the ideas of the American people. They are translating into English some of their hieroglyphics, and that makes it easy to decipher some of their misrepresentations. Many of them are exaggerations and misrepresentations of the grossest character, and of course these cases are dealt with accordingly. The Chinese situation is more difficult to grapple with, because we are not conversant with their literature and language. But the Government is working on this problem now, and is endeavoring to so adjust the situation that it can handle these drugs. In Portland, Mr. Kebler said the conditions obtaining were similar to those in Seattle. The Chinese element is more conspicuous there than in Seattle.

Coming on down to San Francisco, where he spent a week, Mr. Kebler said he had found that the Chinese are by far the dominant foreign element, the other elements sinking into insignificance compared with them. The practical question there is, How is the Government to handle all of these products as they come in? He had seen bales of drugs, un-

packed there containing fifteen or twenty, and probably more, products of different kinds, and it would be a matter of impossibility for the Government to inspect every little package that comes in one of these bales. But the law should be enforced, no matter where the products come from, whether from the Chinese, the Japanese, Poles, Huns, or what not; and it is immaterial for what purpose the goods are imported. They are inspected to protect the health of the people of the United States, whether citizens of the United States or foreigners.

In Seattle the conditions were almost similar to the conditions in San Francisco and other cities visited. He had found comparatively few crude drugs imported outside of those imported by the Chinese and Japanese, and those he had referred to before were imported on the Pacific coast. Most of them are purchased in the east and the conditions that have obtained in the past have been clearly outlined by Mr. Rusby. Whether or not the people have been getting these adulterated drugs on the Pacific coast, Mr. Kebler was not prepared to say; he could find out. He had come to investigate the situation on the Pacific coast, and determine whether or not the people of the United States on this coast have been imposed upon by the brokers in the east by sending them inferior or adulterated drugs.

Referring to the fact that powdered olive stones are met with in drug products, Mr. Kebler said that about a year ago he was going through a large importing establishment where they dealt in all the forms of drugs, spices, etc., and where they showed him every courtesy, as they usually do; and this firm was really trying to conform to the law. He was shown over the establishment, and in one place he noticed a large collection of bags that attracted his attention, and upon making the inquiry as to what they contained, he was told that it was powdered olive stones. He asked the importer what he proposed to do with them, and suggested that he could not use them in products that were to be shipped to the Interstate Commerce. His reply was, that they did not intend to use them in that way, but for the people of his own state. "He was feeding his own people with that product," said Mr. Kebler, "not in the form of a drug, but in the form of pepper." Mr. Kebler said that at the Fair at Seattle he had run across a number of drugs upon which the ban had been placed at Washington. These same goods were being sold 3,000 miles away, and the parties seemed to have no compunction whatever in representing to the people in this section of the country that claims and representations made for these products were true, when they had been shown to be untrue. He immediately set an inspector to work on the situation, and it was not twenty-four hours before these goods were taken off of the Fair grounds and replaced by the proper article.

Mr. Kebler went on to say that he had noticed from some of the pictures he had seen since coming to California that everything was on a big

scale here—that they did not even have small potatoes on the coast—that all the potatoes in the hill were big ones. This particular man had grown 2,000 bushels of potatoes on fifty-five acres of ground, and of course there could be no "small potatoes" there. Likewise there has grown up in this country a spirit of exaggeration to a certain extent—the spirit that we find in patent-medicine advertisements. He said it would take time to cure the conditions obtaining on the Pacific coast, but advised the druggists to take time by the forelock and rectify the situation as early as possible.

Mr. Kebler said Mr. Schneider had referred to the point that frequently it is difficult to decide just what is wanted as to the labeling of products. That might be true. There is no question about the fact, however, that everybody knows when a grossly false and misleading statement is made about a medicine or drug. He said it seemed to be difficult to determine in the minds of some people as to just where they should draw the line. A good way to determine that was this: If there is any line to be drawn, always get on the safe side. Keey away from that line as far as possible, and the farther away the safer it is.

Continuing, Mr. Kebler said that if he could accomplish this one thing he would be very well satisfied; To place in the hands of the druggists of the United States pure drugs, so that they could fill physicians' prescriptions with drugs of the proper character. That was his object, irrespective of the hammering or bombarding that he might get from the brokers and certain importers who have nothing in the world to consider, save the few dollars that they make out of the transaction. Whether or not the people of the Pacific coast were getting inferior and dirty and debased drugs, filled with olive-seeds, etc., he did not know, but he would try to find out about that. He said these parties who sent these adulterated, inferior drugs into the market did not realize what they were doing. About six months ago there had come to him a certain New York broker, who said, "You are ruining my business. You are holding up such and such goods." His reply was, "Why do you object to being held up?" He said, "Because I have a market for these goods, and the people want them." He named a number of prominent houses that were, and had been, using these goods, and were clamoring for them. Mr. Kebler said to him, "Very good: but do you understand the situation?" The broker replied that he didn't know that he did. Mr. Kebler then said; "Here is a product that you are trying to bring on to the market that contains at least thirty-five per cent. of adulteration. Do you know what that article is used for? It is used for making a mild purgative for children. Do you want to feed a product of that type, containing thirty-five per cent. adulteration, to your children?" His reply was, "No, I don't think so." "And that is the situation with every father and mother in this country," said Mr. Kebler; "and we are determined not to let it in." "And it has

not come in," said Mr. Kebler. "It is lying in the port of New York to this day."

Mr. Kebler said he could go on for hours discussing this subject, but there were other matters to be considered, and he would close. He thanked the Section for its indulgence.

Mr. Schneider here took occasion to mention the results of his examination of quite a number of drugs, spices, etc., found in California, showing adulteration all the way from thirty to thirty-eight per cent. This was state work, not federal. In San Francisco, where they have a great deal of fog, and where in the winter-time there is no adequate provision for keeping the stores dry, he had found a large percentage of mould in certain drugs investigated, the samples being taken from both wholesale and retail houses. He had found belladonna leaves adulterated to the extent of fifty per cent., and some samples contained absolutely no belladonna whatever. He asked Mr. Rusby what steps were being taken by the government to stop the importation of this spurious belladonna. Mr. Rusby stated that his remarks on the subject applied to the Atlantic coast, not the Pacific; that they did not know for certain who were the offending parties, but they would find out, and they expected to involve some importers of good repute before they were through with it. He said there was no doubt but that the offense was being committed.

Mr. J. G. Munson, of San José, said he had listened with great interest to the papers read before the Section, and recalled that at a previous meeting it was stated that fifty per cent. of the physicians of the country were dispensing medicine. Mr. Kebler, he said, had spoken of the restrictions placed on the druggist in regard to the medicines and drugs that he sells, but he did not speak of the restrictions that should be placed upon the physicians, who, it was claimed, dispense fifty per cent. of the medicine sold in the United States. Also at a previous meeting it was stated that a great many physicians were responsible for the people becoming addicted to the morphine and cocaine habit. He wanted to know as a matter of information what, if any, restrictions were placed on the physicians in regard to their dispensing. If they are dispensing fifty per cent. of all the medicine in the United States, why should they not have placed on the packages that go out from their private offices the opium or other such alkaloidal content? Why should they be in a separate class, and escape responsibility in this respect, while the registered pharmacist is held to strict accountability? Why should they not be required to place on their label the quantity of morphine per ounce, just as the registered druggist must do? He said he asked for information. In his town of San José he said that more than fifty per cent. of the medicine dispensed was dispensed by the physicians. He had asked one of his physicians not long ago why it was they did that, and he frankly said that it was owing to competition; that they had so many homeopathic physicians there, and they charged

such a small fee for office consultation and furnishing the medicine with it, that they had to meet that competition by dispensing their own medicines. Mr. Munson said he believed the restrictions on the physician should be made a great deal stronger than on the pharmacist. He recalled a case in point where a prescription had been brought into his establishment not long ago, calling for suppositories. In each suppository there was thirty grains of extract of opium. It was brought to him by a particular friend to be compounded, and when he told her that if she took that medicine she would surely die—that one dose of it would kill her—she was very much surprised. He made this the occasion for writing an article upon the unrestricted liberty that the physician has in dealing with people who call on him for medical aid. The physician at the present time can diagnose a case, prescribe his own medicine, compound his prescription incorrectly, and bury his patient, and if the relations don't pay his bill promptly he can sue for the amount of it and collect it. "Is it right," said Mr. Munson, "to allow the physician to bury his mistake?" He believed the dispensing of medicine upon prescription should be solely with the druggist, not only for this reason, but more particularly for the reason that he is the proof-reader of the physician's prescription, and largely has the right to verify what the physician writes. He thought every pharmacist present could tell of prescriptions he had received calling for an over-dose—to say nothing of the incompatibilities. In his judgment, the average physicians know very little about the compounding of the drugs of the Pharmacopœia.

The Chair suggested that while the subject brought up by Mr. Munson was of very great importance and exceedingly interesting, it did not bear directly on the subject-matter before the Section. He suggested that Mr. Munson confer with Mr. Kebler, or, better still, write to the Department at Washington, and they would be able to furnish him considerable information upon this point. Mr. Kebler offered to answer the gentleman at this time, but the Chair thought it would take too much time, and Mr. Kebler contented himself with stating that this was a State matter, pure and simple, and the Federal Government had nothing to do with it.

The Chair stated that the next item upon the program was a paper on "The Materia Medica of Perak," by E. M. Holmes, of London. The paper was in print, and, in the absence of the writer, without objection it would be received to take the usual course. So ordered.

THE MATERIA MEDICA OF PERAK.

BY E. M. HOLMES, F. L. S.

Curator of the Museum of the Pharmaceutical Society of Great Britain.

A donation illustrating the medicinal products employed in native practice by the denizens of the State of Perak in the Malay Peninsula, was recently forwarded to the Museum of the Pharmaceutical Society of

Great Britain by Mr. A. P. Machado, a planter residing on Kemuning Estate, Sungei Siput. The specimens included seventy-four samples of materia medica and one hundred and twenty herbarium specimens. The whole had been exhibited in August, 1907, at an agri-horticultural show at Kuala Kangsar, Perak, where they obtained a prize, and at its close the specimens were forwarded to the museum of this Society. Mr. Machado is an enterprising planter who gained botanical experience in Singapore under Mr. H. N. Ridley, M. A., the Director of the Botanic Gardens in Singapore, and has attempted the cultivation of ipecacuanha, for which he found the conditions not suitable, and is now trying that of plants yielding essential oils, etc.

A review of the specimens received shows that the majority of the drugs have Tamil names, which indicates the influence of that race in Malaya. A few are Chinese drugs, and are evidently employed by the Chinese residents. A number of these are without botanical identification, but the majority of them I have been able to identify, in which case the botanical names are given in parenthesis.

The majority of the herbarium specimens on the contrary bear Malay names, indicating that they are chiefly used by the Malays in the form of herbal remedies. Mr. H. N. Ridley has kindly looked over these for me and has offered suggestions as to their possible source in several instances, in which case the initials H. N. R. will indicate the names suggested by him, but many of the herbarium specimens consist chiefly of leaves or twigs gummed on cards, and until flowering and fruiting specimens are forthcoming, only the Malay names and uses can be given.

A certain number of the drugs are the same as those used in Europe, although the uses made of them are sometimes quite different; others are identical with Indian drugs. I propose, therefore, to notice the Perak materia medica under the following heads:

1. Indian drugs used in Europe.
2. Indian drugs not used in Europe.
3. Chinese drugs.
4. Malay drugs and herbs.

Where the word "herb" is used, it will indicate that the specimen sent consists of a herbarium specimen only.

I. INDIAN DRUGS USED ALSO IN EUROPE.

Acorus Calamus, Linn.—The root is rather small and badly prepared. It is used "for obstinate cases of diarrhœa." No vernacular name is given, but the root in size resembles that of the Japanese *A. spurius*, Schott, considered to be a variety of *A. Calamus*, Linn. (Kew Index).

Aegle Marmelos, Correa.—This consists of the ripe fruit and pulp broken up and badly dried. It is labeled "a famous remedy for dysentery."

Aloes.—"Karia-palam" (Moodeen Sheriff spells this Tamil name "Kariya-polam"). The drug has the appearance of curacoa aloes of good quality, and gives the crimson reaction with nitric acid.

Alpinia officinarum, Hance.—"Sitaratai" (Shittarattai, Tamil). This is the ordinary form of galangal root, and is "used for parturition in women."

Areca Catechu, Linn.—This consists of areca-nut charcoal in coarse powder, and is labeled "a well-known vermifuge for children."

Anethum Sowa, Roxb. (*Peucedanum Sowa*, Kurz).—Sadakupeh (Shata-kuppi-virai, Tam.). The fruits are regularly imported into this country, and are official in the B. P. Colonial and Indian addendum. It is "used as a stomachic for women after parturition."

Citrus Aurantium, Linn?—Chin peh (Chinese Ch'in p'i). The rind is that of a species of Citrus cut into slender strips like that of Maltese orange peel, but badly dried and nearly black. It has a salt taste and has apparently had removed as much as possible of the white spongy portion, and then been soaked in a solution of salt and subsequently dried, but it possesses the flavor of orange.

Croton Tiglium, Linn.—The smooth fruits are simply labeled "Croton oil seeds, a powerful purgative." No vernacular name is attached to them.

Cassia angustifolia, Vahl.—This appears to consist of Mecca senna as the leaves are smaller than the Tinnevelly sort, are of mixed sizes and of inferior quality. It is labeled "Senna, a well-known purgative."

Cuminum Cyminum, Linn.—"Machir wong." These are cummin fruits apparently produced in Asia, judging from the pointed shape of a few coriander fruits mixed with them, but I have been unable to identify the vernacular name with any Chinese, Indian or Malay name for the fruit.

Eugenia caryophyllata, Thunb.—The cloves are of inferior quality and dark color and frequently show a portion of pedicel attached to them. They are "ground with cinnamon bark and rubbed on the head for aches, etc."

Myristica fragrans, Houtt.—This consists of the nutmeg in the shell, in which form it is usually preferred in the East, as it thus retains its odor and is protected from insects. (The process of liming nutmegs was originally adopted by the Dutch with the view of preventing germination and so obtaining a monopoly of the spice.) The nutmegs are of the ordinary type but rather small. They are "mixed with milk and applied for roughness of the tongue in infants."

Papaver somniferum, "Kasa Kasa" (Gashagasha, Tamil).—The seeds are white. "They are mixed with milk and boiled for cooling the system."

Piper Species, "Walmulago" (Valmilaku, Tamil).—The fruits appear to be those of *Piper ribesioides*, Wall. They are roasted with other herbs and used for coughs. An account of these fruits may be found in the

Pharm. Journ. (3), xxiii, pp. 121, 734. During the last few years of the present century the fruits of *P. ribesioides* have appeared on the London market. They evidently take the place of ordinary cubebs so far as Perak is concerned.

Piper longum, Linn.—Arishi tipillai (Tipilli, Tamil). This corresponds to the ordinary Piper longum of British commerce. It is labeled, "administered to hasten parturition." Another specimen bearing the same vernacular name except that it is spelled "Arisiti pillai," consists of the shorter and less compact fruits of an allied species, probably *P. officinarum*. The prefix arisi or arishi is Tamil for rice without husk. I do not find it applied to *Piper longum* either by Moodeen Sheriff or D. Dymock. It is labeled, "For correcting the stomach of women after parturition."

Smilax China, Linn.—Paringgi Pateh (Paringa-puttai, Tamil). The specimen consists of the root broken up. It is "ground with ginger and used as a drink for rheumatic pains."

Strychnos Nux-vomica, Linn.—Neti koteh (Ettik-kottai, Tamil). The seeds are of small form. They are labeled, "If three seeds are consumed in 48 days, the body becomes innocuous to the attack of any poisonous animal."

Swertia Chirata, Buch.-Ham.—"Nila-vembu (Tamil)." It is "mixed with castor oil and given as an opening medicine."

Trigonella Fœnum-Græcum, Linn.—"Vendia vereh" (Vendayam, Tamil). The seeds are of small form. They are labeled, "Drunk with milk to stop dysentery."

Zingiber officinale, Rosc.—The rhizome is small and badly prepared. It is labeled, "A valuable stomachic."

2. INDIAN DRUGS USED IN PERAK.

Adhatoda Vasica, Nees.—"Adatodae." The leaves are used for gastritis in children; it is infused with Karppuravalli (*Coleus aromaticus*, Benth.) leaves and given as a beverage. The active principle of the leaves and the uses of the plant are described by M. D. Hooper in Pharm. Journ. (3), xviii, p. 841.

Brassica species.—"Mustard Seed." Used for poultices, headaches, etc. The seeds are brownish, but as large as those of white mustard. The plant raised in my garden from these seeds is a form of *Brassica campestris*, Linn.

Cæsalpinia Bonducella, Roxb.—"Kalachi Koteh" (Kalanchik Kuru). The seeds, "ground and mixed with lemon juice, are used for reducing swelling of the testicles." This use probably arises from the doctrine of signatures, as the Persian name for the seeds is "Khaya-i-Iblis" (Devil's testicles). Dymock, Mat. Med. W. Ind., p. 202. Necklaces of the seeds are worn in India by pregnant women to prevent abortion. Internally they have been used in leprosy, and were introduced into the Pharm. of

India as a tonic and anti-periodic. The seeds contain, beside the bitter principle, a fatty oil. (Pharmacographia, p. 213.)

Carum Copticum, Benth. and Hook.—"Omum" (Omam, Tamil). The fruits are used externally for infantile ailments. See Dymock, Mat. Med. W. India, p. 301.

Cassia alata, Linn.—"Glengang Gajah" (Glenggang, Malay). The decoction of the leaves is used as a remedy for diarrhœa. Externally as a remedy for all kinds of itch. See also Dymock, Mat. Med. W. India, p. 217.

Cinnamomum Burmanni, Bl.—"Karoa Pateh." The bark is apparently that of *C. Burmanni*, and identical with the Padang cassia or Cassia vera of the London market. It is hard and mucilaginous, and has a weak flavor resembling that of cassia. The name for cinnamon is Karuvap-pattai; for *C. iners*, Reinwr, Kattkaruvap-upattai; for *C. Tamala*, T. Nees, Talisha-pattai; and for cassia, Periya-lavanga-pattai. The bark is "used for giddiness." For histological characters of Cassia bark, see Mus. Report Ph. Soc. 1895–1902, pp. 48–55.

Clerodendron serratum, Spreng.—"Seru teku" (Shiru-tek, Tamil) The root is "used as a remedy for coughs."

Coleus aromaticus, Benth.—"Karpurai velle" (Karppura valli, Tamil). The leaves are a valuable stomachic for infants. The Tamil name is applied both to this plant and to *Anisochilus carnosus*, Wall. but to the latter incorrectly; the leaves are not those of the latter species.

Curcuma aromatica, Salisb.—"Kasturi manjal" (Tamil). This root is "mixed with garlic and used as an emollient after measles." The root is still used in Germany under the name of zedoary root.

Curcuma Zedoaria, Rosc.—"Pula kalangeli" (Pulan-kizhangu, Tamil). "A mixture of this and cocoanut oil is used for various affections of the eye." This root was formerly used in Europe under the name of zerumbet root.

Cyperus scariosus, R. Br., (*C. pertenuis*, Roxb.)—"Kora kalengu" (Koraik-kizhangu, Tamil). Used as "a remedy for disorders during teething in children."

Elephantopus scaber, Linn.—"Tutop bumi" (Tutup bumi, Malay). An infusion of the plant is prescribed for liver complaints. On the Malabar coast, according to Rheede, a decoction of the root and leaves is given for dysuria. It appears to be mucilaginous. Dymock, Mat. Med., W. Ind., p. 713.

Elettaria Cardamomum, maton, var. major.—"Yeler arisi" (Tamil, Ela or Elaka). The seeds are recognized by Sir Geo. Watt as those of *Elettaria Cardamomum*, Maton, var. Major, Sm. Yeler seems to be a corruption of Ela, which is the Tamil name for cardamoms, and arisi means without husk.

Embelia robusta, Roxb.—"Vaivelanga" (Vayuvilangam, Tamil).

The fruits are described in books as those of *E. ribes*, Burm., but this specimen, as all other commercial samples I have ever received, are invariably those of *E. robusta*, and are easily distinguished by being longitudinally ribbed. The Perak use for these fruits is "for reducing swelling in horses' legs," for which purpose they are "mixed with ginger and brown sugar." For their use as an anthelmintic in skin diseases and for other purposes, see Dymock, Mat. Med., W. Indies, p. 389.

Garcinia Mangostana, Linn.—This consists of the rind of the unripe fruit carefully dried. It is labeled "a valuable astringent in diarrhœa cases;" no vernacular name is given, the Hindustani name being the same "Mangústán."

Glycyrrhiza glandulifera, Waldst. & Kit.—Liquorice root is used in the form of a decoction for coughs, colds, etc. This root has the reddish tint and scaly surface of Eastern liquorice root, and is probably derived from the above species.

Hedychium spicatum, Sm.—"Pula kalangeh." (Shimai-kich-chilik kizhangu. Tamil.) The sliced root evidently agrees with the Bombay specimen in the museum, but the name is apparently Malay. See notes *Alpinia kulangan* in Moodeen Sheriff, Supplement to the Pharmacopœia of India, pp. 266–274.

Helicteres Isora, Linn.—"Murukite Pillay." (Marorphali, Hind.) The spirally twisted pods are "used for earache," an extract made from them being mixed with cocoanut oil for the purpose. In India, according to Dymock. Mat. Med. W. Ind., p. 91, it is used also for griping and flatulence in children. It belongs to the natural order *Sterculiaceæ*.

Lagenandra lancifolia, Thw.—"Adi vedayam." (Ati udayam, Singh.) This is stated to be an invaluable remedy for indigestion, gastritis, etc. In Ceylon it is used in nervous fever. This rhizome has been imported on more than one occasion into London and offered as ipecacuanha root, to which it has a superficial resemblance, but differs in its endogenous structure, and in having brown pigment cells in the parenchyma, P. J. (3), xxiv, pp. 210, 211.

Nigella sativa, Sibth.—"Karin siragam." (Karun shiragam, Tamil.) "Administered with radish, turmeric, ginger, and bamboo shoots to horses watering from the nose. The seeds have many uses in India. See Dymock, Mat. Med. W. India, p. 11. The active principle, melanthin, obtained by Greenish, P. J. (3), ix, pp. 909, 1013, appears to be of the nature of a saponin. The seeds of *N. damascena*, Linn., resemble those of *N. sativa*, but have a strawberry odor when bruised. Nigelline and connigelline were obtained from Nigella sativa by Pellacani, P. J. (3), xiv, p. 863.

Pharbitis Nil var., Choisy.—(*Ipomoea hederacea*, Jacq.) "Vellai erete vereh." (Vellai-jiriki-virai, Tamil.) The spongy porous, whitish root under this name is presumably that of a red-flowered *Pharbitis*, referred as a

variety to *Pharbitis Nil* Choisy. It is labeled "a remedy for scorpion and other stings." See Moodeen Sheriff, Supplement to the Pharm., p. 277.

Phyllanthos Emblica, Linn.—"Nelika" (Nelli-kay, Tamil). The fruits are "used for reducing redness of the eyes." They possess astringent properties. See Dymock, Mat. Med., W. India, p. 575.

Picrorrhiza Kurroa, Royle.—"Kadaku rohani" (Katuku rogani, Tamil). "For exhaustion in horses it is mixed with beer and eggs and given." The root is mentioned by Moodeen Sheriff, Suppl. Pharm. India, p. 279, as a very good tonic and antiperiodic. It is easily recognized by its transverse fracture, which exhibits an interrupted ring of pale porous wood in a black central tissue, and its very bitter taste. See Pharm. Journ. (4), 13, p. 498. Dr. Dymock, Mat. Med., W. India, also speaks of its value as an antiperiodic in doses of 40 to 50 grains with aromatics. The active principle, picrorrhizin, is a glucoside soluble in water and alcohol but almost insoluble in ether. Pharmacographia Indica, III, p. 14. It is now official in the Indian and Colonial addendum to the British Pharmacopœia.

Quercus Lusitanica, Lam.—(Q. infectoria, Oliv.) "Masika" (Mashik-kay, Tamil). These are dark-colored or bluish-green galls differing only from Aleppo galls in the larger number of prominences on the surface. The galls are ground into powder and administered for sore mouths, etc."

Saussurea Lappa, C. B. Clark.—"Koshton" (Goshtam, Tamil). "The root ground and mixed with salt and boiled is used as a tonic after parturition." See Dymock, Mat. Med., W. Indies, p. 372, Pharm. Journ., 1877. It has the odor of violets and is the Costus root of the ancients. See Pharm. Journ. (3), viii, pp. 41, 221. The root is said to be useful in allaying the craving for opium smoking, etc.

Sida retusa, Linn.—"Karing toti eleh" ("Karan tutti, Tamil"). "The leaves are administered to cattle suffering from looseness. In Ceylon the leaves are applied to the head to cool it and to relieve giddiness, and with other drugs in fever." Like most of the *Malvaceæ* they possess demulcent properties.

Solanum Jacquini, Linn.—"Kandong Katrika" (Kandan-kattiri, Tamil). The fruits are smoked to allay toothache. According to Dr. Dymock the plant has expectorant and diuretic properties and is prescribed in asthma cough, certain urinary affections, catarrhal fever, costiveness, and in Ceylon for enlarged spleen and liver. The leaves of this plant under the name "Kandang Katrika" are labeled "Infusion given for coughs in children."

Terminalia Chebula, Retz.—"Kadika" (Kadu-kay, Tamil). The mature fruits are labeled, "Ground and powdered used for ulcers." They possess astringent properties. The black immature dried fruits, "Pinji Kadeka" (Kaduk-kay-pinji, Tamil). The galls of the plant "Kadeca pu"

(Kaduk-kay-pu, Tamil) are labeled, "A remedy for sore ulcers, etc." These galls are ignorantly regarded as the flowers of the plant; "pu," meaning flowers. They are labeled "used for toothache." But in India and Arabia the powdered fruits are used in diarrhœa and dysentery.

Terminalia Bellerica, Roxb.—"Tanaka" (Tanrik-kay, Tamil). The fruits are labeled, "Ground, and mixed with milk are used for internal abscesses." In India the fruits are considered to be astringent, tonic and aperient, the pulp being the part used. The seed, if taken in quantity, is narcotic. It is sometimes applied externally to inflamed parts.

Trichosanthes cucumerina, Linn.—"Pepadeleh" (Kattup-pe-pudal, Tamil). The leafy stems are "mixed with senna leaves and ginger, and used as a purgative." The plant has many other medicinal uses. See Dr. Dymock, Mat. Med. W. Indies, p. 285.

Vernonia anthelmintica.—"Karti Sirangam" (Kattu-shiragam, Tamil). The seeds, mixed with the juice of a lime, are "a remedy for the morning sickness of women." In India it is used for leucoderma and other skin diseases, and as an anthelmintic. (Dymock, Mat. Med. W. Indies, p. 350). In Ceylon it is also used in fever with convulsions, and also to remove excessive phlegm in coughs.

Withania somnifera.—"Amu Krakalengu" (Amkoolang, Tamil). The root is used as an external application for syphilitic sores.

3. CHINESE DRUGS USED BY THE COOLIES IN PERAK.

Akebia quinata, Decne.—"Mok Tong" (Mu-t'ung, Chin.). The sliced root has a porous radiate structure like that of *Clematis*, and apparently species of that genus are often used as substitutes for it. It is "a very successful diuretic." See Porter Smith, Mat. Med., China, p. 66, under *Clematis vitalba*.

Achyranthes bidentata, Blume.—"Niu-chit" (Niu-sihbhin). "The root sliced is boiled with pork and spirits and given for extreme anemia." The drug is so identified by Dr. A. Henry, but it has not a typical Amaranthaceous structure, more resembling that of a Ranunculaceous rhizome.

Alpinia Galanga, Willd.—"Pun te keo" (Hung-tau-k'aubhn). The fruits are mentioned by Dr. Porter Smith, l. c. p. 9. They are used in Perak "for stomach ache."

Apocynum juventus, Lour.—"Sien Wu" (Hoshan-wu Chin.). The sliced root is "used as an appetizer after convalescence." In China it is considered invigorant, antiscrofulous, etc. See Dr. T. Porter Smith, p. 19.

Belamcanda Chinensis, Lam.—"Sa Hon" (She-Kan, Chin.). The root is used as a remedy for sore throat. It is identified by Dr. A. Henry as the above plant in the list of Chinese medicines of the Chinese Imperial Maritime Customs 1889. In China as a diuretic carminative and anthelmintic.

Carthamus tinctorius, Linn.—"Tung fa." (Hung-hwa, Chin.) The specimen consists of the florets only, "a decoction of the florets with sam shu and hot water is given for internal bruises."

Cassytha filiformis, Linn.—"Su Si." The stems are used for swollen eyes, also as a diuretic.

Chrysanthemum Species.—"Kuk fa" (Chu-hwa, Chin.). The flowers are used for a drink for blood-shot eyes.

Edgworthia species?—"Pun Niou." This apparently consists of the root and stem of some Thymelaceous plant, judging from the finely fibrous tough bark of the root and somewhat acrid taste, but in the absence of a Chinese grammalogue it is not possible to trace it, as a similar specimen does not occur in the museum collection.

Gleditschia Sinensis, Lam.—"Cho che" (Tsau-koh-tsze F. P. S.). The thorns are made into a drink to allay the irritation caused by prickly heat, but in China are used as an anthelmintic and to reduce tumors F. P. S., l. c., p. 105.

Hyptis Species?—"Kin Ka." The herb has an odor of pennyroyal but the leaves are sub-pinnate with linear segments. The calyces contain black pyrenes, but the corolla is absent. It is "used as a drink for headache." See Mint F. P. S., l. c., p. 150.

"*Kun Keong.*"—The sliced roots are a "well-known vermifuge."

Lonicera Japonica, Thunb.—"Chuen fa" (Chin-yiu-hwa). The corollas are used as a nerve tonic. In China as a discutient in rheumatism, dropsy and aphthae according to Dr. Hokai.

Lycium Chinense, Müll.—"Ka pi" (Pi kuh pi). The bark is "mixed with spirits and used for rheumatic pains."

Melia Toosendan, Sieb. & Zucc.—"Shun di-an" (Chuen-lien-tsze, Chin.). The fruits are "used as a remedy for swollen testicles." The name appears to be a corruption of the Japanese name Toh-sendan.

Papaver somniferum, Linn.—"Sin Koh." This consists of sliced poppy capsules. "It is drunk to allay the desire for opium."

Phellodendron Amurense, Rupr.—"Wong Pak" (Huang Po). The sliced yellow bark is used for toothache. For the structure of this bark, see P. J. (3), xviii, p. 785. The bark in the reference given is referred to *Evodia glauca*, Miq., which is identified in the Index Kewensis with *Evodia meliæfolia*, Benth., but Dr. Augustin Henry has recognized the drawing on the specimen sent as the wood of *Evodia glauca* from Japan as *Phellodendron amurense*, Rupr., since it represents the baccate fruit with five endocarps, characteristic of *Phellodendron*, instead of the four free carpels of *Evodia*. In foliage the two plants bear considerable resemblance.

Rheum species.—"Tai wong" (Ta-hwang). The sliced root is used for giddiness.

"*Seong San.*"—The sliced root is "used for ague in malaria." It has no marked taste.

Si Yap (*Perilla ocymoides*, Linn.?).—"The leaves used as a bath will reduce the temperature of fever."

Trichosanthes multiloba, Miq.—"Tien fa" (Ti'en-hwa-fen), Dr. A. Henry. The sliced, starchy root is used for coughs.

Uncaria Gambier, Roxb.—"Keo Ten" (Tien t'ang, F. P. S.). The hooked spines are used as a tonic for children.

4. MALAY DRUGS USED IN PERAK.

Baeckia frutescens, Myrtaceæ.—"Suji atapu." The leaves are labeled "mixed with beer and eggs as a tonic for horses." They are rather smaller than the leaves of *Baeckia frutescens*, Linn., presented to the museum by Mr. H. N. Ridley, M. A., under the Malay name of Daun Churon Atap, but when he saw them, he considered that they belong to that species, which is used at Singapore as an aromatic infusion in cases of fever, and forms one of the ingredients of a medicine given after confinement.

Cinnamomum vimineum, Nees.—"Teradiah patei." This bark appears to be identical with the kulit lawang bark sent by Mr. L. Wray in 1892. See Pharm. Journ. (3), xxiii, p. 390. It is a thick bark, coarsely fibrous, with a flavor recalling that of nutmeg and sassafras. The word patei or pattai is Tamil for bark, so that the name is probably a Tamil name also, but teradia does not occur in the works of Dymock or Moodeen Sheriff.

Imperata cylindrica, Beauv.—The rhizome is labeled "a valuable diuretic." It is used in the same manner as *Triticum repens* in Europe; no vernacular name is given. In the *Index Kewensis I. cylindrica*, Beauv., is considered to be a variety of *I. arundinacea*, Cyrilli. According to Filet, *Plantkundig Woordnboek*, v. Ned. Indie, p. 13, no. 263. The Malay name for the drug is allang allang, and it is used in dropsy, but it does not appear to be mentioned by Ridley in his Malay Materia Medica under that name. According to Rosenthal, Pl. Diaph., p. 1078, it is especially valued as a diuretic in cases where the dose of opium has diminished the secretion of urine, and is therefore probably of Chinese introduction. It occurs in the Chinese collection of drugs from Singapore, and in the Hong Kong collection of Chinese drugs presented by Dr. Hokai, where it is labeled (Mao-ken), "Used as a febrifuge."

Piper ribesioides.—"Walmulago" (Valmilaku, Tamil). The fruits resemble those of *Piper ribesioides*, Wall, and are labeled: "Roasted with other herbs and used for coughs." The names are evidently a corruption of the Tamil one, which is applied to true cubebs, *Piper Cubeba*, Linn., which these fruits are not. *Piper ribesioides* is collected in the Selangor district of Perak, and is therefore the local cubebs. P. J. (3), xxiii, p. 122.

Velle erekeleh.—The leaves so named are so decayed that it has not been possible to identify them. "It is used for those suffering from

swelling of the soles. The leaves are roasted, mixed with children's urine and applied."

Leah Pana.—Under this name evidently a corruption of Ayapana, the leaves of *Eupatorium triplinerve*, Vahl., are used for indigestion. The plant is said to have been originally introduced to Perak from the Mauritius. The name Ayapana is however Brazilian; it was introduced into Mauritius from that country in 1797 by a Capt. A. Baudin. Bouton. Pl. Med. de Maurice (1864), p. 84.

HERBARIUM SPECIMENS OF MALAY DRUGS FROM PERAK.

Acrostichum sorbifolium, Linn.—(Filices) "Merkap." "Applied externally for swellings of the testes."

Atalantia monophylla, D. C. (Rutaceae) "Soloroh arjam." "For assisting parturition."

Bambusa schizostachyoides, Kurz.—(Graminaceae) "Bulu plang." "Mixed with durian leaves and boiled is used as a liniment after parturition." This plant is referred to in the Index Kewensis to *Melocanna Kurzii*, Munro. The Malay name is also applied to Gigantochloa Wrayi, Jamble.

Bauhinia bidentata, Jack.—(Leguminosae) "Glembang." "For promoting the menstrual flow in women."

Callicarpa longifolia, Lam.—(Verbenaceae) "Tampang besi." "Used as a wash for typhoid fever."

Cassia alata, Linn.—(Leguminosae) "Gleng gajah." "Boiled it is drank as a cure for diarrhoea; it is also a well-known remedy for all kinds of itch." See p. 2.

Celosia cristata, Linn.—(Amaranthaceae) "Mega." "For healing ulcers."

Cinnamomum iners, Rein.—(Lauraceae) "Kora Bunka." "A remedy for liver complaints."

Cnestis ramiflora, Griff.—(Connaraceae) "Simle akar." "Applied to the back eases the strain of remaining in the same position after circumcision."

Curanga amara, Juss.—(Scrophulariaceae) "Rampadu tanah." "A very bitter stomachic."

Didymocarpus flava, Ridley.—(Gesneraceae) "Ples merah." See Tilet, 8624–5. "For stomach ache."

Dioscorea Dæmona, Roxb.—(Dioscoreaceae) "Ubi ara." "A remedy for the peculiar skin affection known as 'Pura' among the Malays and confined to them."

Durio zibethinus, Murr.—(Malvaceae) "Durian." "Used after parturition as a wash."

Drymoglossum piloselloides, Presl.—(Filices) "Sipuleh." "For stomach ache."

Drynaria quercifolia, Bory.—(Filices) "Kepala tupai." "Applied to the heads of children on signs of fever appearing."

Elephantopus scaber, Linn.—(Compositae) "Tutup bumi." "An infusion of this is prescribed for liver complaints." See p. 2.

Epipremnum medium, Engl.—(Araceae) "Sawan merawi." "Reduced to ashes it is applied to the face and eyes of children in convulsions."

Eurycoma latifolia, H. N. Ridley.—(Simarubaceae) "Tonkat ali." "A valuable aphrodisiac for men."

Ficus alba, Reinw.—(Urticaceae) "Kacheh fatima." "For gonorrhoea."

Forrestia marginata, Harsk.—(Commelynaceae) "Setaw-an-ubain."

Geunsia farinosa, Bl.—(Verbenaceae) "Katu karahan." "Used as an application for buboes."

Glochidion species.—(Euphorbiaceae) "Sinda hariman." "Used for bone aches." *G. sericeum* Hook. f. is known as Sindarong.

Gomphostemma crinitum, Wall.—(Labiatae) "Chapa utan." "Used for exorcising evil spirits."

Grewia fibrocarpa, Mast.—(Tiliaceae) "Chindrai utan." Chenderai Rimba, Ridley. "Applied externally; a well-known pain killer."

Helminthostachys Zeylanica, H. N. Ridley.—"Used by men as an aphrodisiac and by women for increasing the menstrual flow."

Hibiscus Abelmoschus, Linn.—(Malvaceae) "Kapas hantu." "Used for headaches."

Hydrocotyle Asiatica, Linn.—(Umbelliferae) "Pegaga." "A recognized blood purifier amongst all natives on the Coast."

Ixonanthes icosandra, Jack.—(Linaceae) "Pagar anak." "Applied to the head of children corrects their tone." See Ridley, *Malay Plant Names*, p. 198.

Jambosa aquea, D. C.—(Myrtaceae) "Jambu Ryer."

Justica Gendarussa, Burm.—(Acanthaceae) "Gandar rusa." "Used for pains in the side."

Leea sambucina, Willd.—(Ampelidaceae) "Memali buche." "Bruised and applied to leprosy sores."

Leucas lavandulaefolia, Linn.—(Labiatae) "Tombeh." "For stomach-ache in children."

Loranthus Malaccensis, Hook. f.—(Loranthaceae) "Dedalu api." "Bruised and rubbed over the body a remedy for ague."

Lygodium macrophyllum, Br.—(Filices) "Ribu ribu." "Applied to the head to reduce temperature in fevers."

Mallotus macrostachyus, Müll., Arg.—(Euphorbiaceae) "Balik Angin." "Boiled and drunk cures flatulency."

Mallotus Huiletiana, H. N. Ridley.—(Euphorbiaceae) "Tampaian Batu." "A cure for polypi in the nose."

Melastoma Malabathricum, Linn.—(Melastomaceae) "Kedudoh"

or Senduduk. See Ridley, *Malay Plant Names*, pp. 129–243. "For worms in teeth." See *Sonerila begoniaefolia*, p. 5.

Melothria affinis, King.—(Cucurbitaceae) "Mentimun tikus." "A remedy for gonorrhœa." See Ridley, *l. c.* p. 272.

Morinda citrifolia, Linn.—(Rubiaceae) "Mengkudu." "A cure for coughs." See Ridley, *l. c.* p. 122.

Mussaenda glabra, Dahl.—(Rubiaceae) "Balik adap." "For giddiness in children." See Ridley, *l. c.* p. 46.

Pangium edule, Reinw.—(Bixaceae) "Kepayang." "Used as a beverage to correct that feeling of ennui and tastelessness of the mouth on rising in the morning."

Pellacalyx Saccardianus, Scortech.—(Rhizophoraceae) "Stilim." "A tonic for women during pregnancy."

Phyllanthus pulcher, Wall.—(Euphorbiaceae) "Naga bonêh." "For swellings of the stomach."

Piper porphyrophyllum, N. E. Brown.—(Piperaceae) "Sireh riman." "Applied to remove the white blotches so frequently seen in Malay bodies."

Pometia pinnata, Forst. (H. N. R.).—"Kasai" (Sapindaceae). "For headaches."

Sindora Wallichii, Benth. (H. N. R.).—"Matsiang" (Leguminosae). "For external application for worms in children."

Solanum torvum, Swartz.—(Solanaceae) "Sara saiya." "Used as a cushion for women during parturition."

Sonerila Moluccana, Roxb.—(Melastomaceae) "Kedudoh." "Bruised and applied to joints removes rheumatic pains."

Stenotaphrum Helferi, H. N. Ridley.—(Graminaceae) "Rumput macan Kuda." "Used to make a beverage for women after childbirth, before taking any food."

Tinospora cordifolia, Miers.—(Menispermaceae) "Ular-ular." "For erysipelas."

Uncaria macrophylla, Wall.—(Rutaceae.) "Bruised and mixed with lime and applied to the navel of children for worms."

Cissus cinerea, Lam.— Ampelidaceae) "Lakom utan." "For severe colds."

Xerospermum Noronhianum, Bl.—(Sapindaceae) "Rambutan pachat." "A remedy for any one of the 190 diseases known to Malay quacks."

PERAK MEDICINAL PLANTS—HERBARIUM SPECIMENS NOT IDENTIFIED.

Bajang angin.—For colds.

Bonglai terbang.—A universal remedy among Malays for all the ills that flesh is heir to.

Bras bras.—For healing circumcision wounds.

Dangla.—An application for the stomach after childbirth.

Jambu berte.—A cure for skin eruptions.

Jarom jarom pasir.—Applied externally for polypi in the nose.

Kanching baju.—Applied for allaying irritation of the gums.

Kaliri.—A drink for women in pregnancy.

Kekabu.—Used as a beverage to hasten parturition.

Kempening.—Applied externally for giddiness.

Kernam.—Applied externally to allay the eruptions of erysipelas.

Kunchir.—For skin diseases. (Kudis in Malay.)

Lada-lada.—A good remedy for gonorrhœa.

Modu.—To reduce griping pains in the abdomen.

Mali beduri.—A mouth wash after protracted illness.

Mataiang.—For liver complaints.

Medang manka.—Boiled and sipped allays the spasms of asthma.

Medang pusot mana.—Application for buboes.

Medang umbut.—A remedy for flatulence.

Patutua.—For healing boils after bursting.

Pempadan.—An invaluable remedy for thread worms.

Penguchuk.—A cooling beverage for women after pregnancy.

Permadani.—Applied to the anus for worms in children.

Plangas rimba.—For heartburn, to be drunk as a decoction.

Plereh.—For exorcising evil spirits inhabiting streams and marshes.

Ples.—Applied externally for swellings of the abdomen.

Robai.—A vermifuge.

Ruku-ruku.—Bruised and rubbed over the body reduces the temperature in fevers.

Sampu kura.—In strong fevers to be used as a bath just as the sun is rising.

Sarilai.—Mixed with rice applied for mumps.

Sempo kuning.—Applied externally for jaundice.

Sengiring.—Boiled and drunk removes instantly flatulence.

Seraja kayu.—A remedy for dysentery.

Serapat.—It is drunk as a decoction, and it is also rubbed on the thighs to reduce the enlargement of the female abdomen after parturition.

Sernas vasi.—Invaluable for correcting discharges in women after parturition.

Setuboh.—Applied externally for "beri-beri."

Simlo ular.—A remedy for gastritis.

Sunkai.—Applications for swellings of elephantiasis.

Tebus selnang.—Applied to allay pains in the joints.

Tebu tangloong.—A sovereign remedy for earaches.

Tepus terbang.—A vermifuge for children.

Temi kuchin.—A remedy for colds, used as an infusion.

Tentilan.—Applied externally to the spleen in enlargements of same.

Tetawan.—For convulsions in children.

Tradang malam.—A sovereign remedy for those bad headaches during an attack of malarial fever.

Tuja utan.—Applied externally for liver complaints.

The Chair called attention to a paper contributed by Miss Alice Henkel, of Washington City, a member of this Association and a worker in the Bureau of Plant Industry, upon the subject of some desirable changes in the botanical nomenclature of the Pharmacopœia. All knew the work she was doing, and this paper was along that line. He stated that, without objection, the paper would be received, to take the usual course, and it was so ordered.

SOME CHANGES IN BOTANICAL NOMENCLATURE OF U. S. P.

BY ALICE HENKEL.

It is not, of course, the policy of the Committee on Revision to change the titles in the United States Pharmacopœia with every change that takes place in botanical nomenclature, but when there occur within its pages names that may be classed as misnomers, it would certainly seem desirable to drop these and substitute the names which really designate the plants under consideration. The most striking instance of such "misbranding" among the plants of this country will be found in the name "Prunus virginiana" applied to the tree which furnishes the wild cherry bark of commerce; another case is the name "Gossypium herbaceum," by which the American cotton plant has been known for many years.

For ninety years the United States Pharmacopœia has adhered to the use of the pharmacopœial name "Prunus virginiana" for the wild cherry, although for thirty years it has acknowledged *Prunus serotina* as the botanical source.

Prunus virginiana L., and *Prunus serotina* Ehrh. are two distinct species. *Prunus virginiana* of Linnaeus, according to his description (Sp. Pl. 473, 1753) and herbarium specimen was based on the species known in this country as the choke cherry. Miller (Dict. ed. 8, 1768) described the species now known as *Prunus serotina*, but referred it to *Prunus virginiana*. But Ehrhart (Beitr. z. Naturk. 3, p. 20, 1788) first distinguished between the two and gave to the wild black cherry the name *Prunus serotina*, which has now long been the accepted name, and to retain the pharmacopœial designation "Prunus virginiana" is misleading.

Almost from the very beginning *Prunus virginiana* and *Prunus serotina* have been confounded in one way or another. This is very evident when reviewing the literature on the subject. Michaux seems to have been responsible for much of the trouble, inasmuch as he mistook *Prunus serotina* (wild black cherry) for the Linnaean species *Prunus virginiana* (choke cherry), and his transposition of the specific names was followed by most of the early botanists, and naturally a confusion of the common

names resulted. The wild black cherry is now, however, and has been for many years, universally recognized as *Prunus serotina* Ehrhart, while the choke cherry is the *Prunus virginiana* Linné, and the Pharmacopœia might well do away with "Prunus virginiana" as the official Latin name for *Prunus serotina*.

From the descriptions given below, taken from Gray's New Manual of Botany, seventh edition, 1908, it will be seen that there is considerable difference between the two species. A distinction of interest from a pharmaceutical point of view is made with regard to the inner bark. The descriptions are as follows:

Prunus virginiana L. (Choke Cherry.) A tall shrub or small tree with grayish bark, the inner layers with a rank, disagreeable odor; leaves oval, oblong, or obovate, abruptly pointed, very sharply (often doubly) serrate with slender teeth, thin; petals roundish; fruit red turning to dark crimson, austere and astringent; stone smooth.—Newfoundland to Georgia, and westward.

Prunus serotina Ehrh. (Wild Black or Rum Cherry.) A large tree, with reddish-brown branches, the inner bark aromatic; leaves oblong or lanceolate-oblong, taper-pointed, serrate with incurved short and callous teeth, thickish, shining above; racemes elongated; petals obovate; fruit purplish-black.—Woods, Nova Scotia to Florida, west to Dakota and Arizona.—Fruit slightly bitter, with a pleasant vinous flavor.

Since its introduction into the Pharmacopœia, in 1850, the botanical name of the cotton plant has been given as *Gossypium herbaceum*, and for many years it has been so called in botanical and other works. Recent investigations have shown, however, that *Gossypium herbaceum* is not an American cotton at all, but is the name of an Old World species, known as Levant cotton, cultivated in India and also in southern Europe. The appellation *herbaceum* to the American cotton plant is evidently the result of wrong identification by early American authors, and the assumption that it originated from European seed (Dewey, L. H., Science, n. s., vol. 19, p. 337, 1904).

The type most commonly cultivated in the South is the American upland cotton, and this with its five hundred or more recognized horticultural varieties all belong to one species, *Gossypium hirsutum* L., and not to *G. herbaceum* L. (Dewey, L. H., Yearbook, U. S. Dept. Agr. 1903, p. 388.)

Gossypium herbaceum "has leaves with roundish or broadly acuminate lobes, yellow flowers purple at the base of the petals, toothed bracts and nearly spherical, umbonate, five-celled bolls to which the lint tenaciously clings," while *Gossypium hirsutum* "has acutely lobed leaves, white flowers, turning purple (but rarely with purple at the base of the petals), deeply cleft bracts, and ovate, four to five-celled bolls, from which the lint is free at maturity." The American cotton plant was called *Gossypium hirsutum* by Linnæus in 1763, and in recent years, especially, European

authors have referred the American plant to this species. (Dewey, L. H., Science, n. s., vol. 19, p. 337, 1904.)

In view of the above, and since cottonroot bark, purified cotton and cottonseed oil are not likely to be obtained in this country from any other than the American cotton, it would seem desirable to change the wording in the Pharmacopœia so as to read: "*Gossypsum hirsutum* Linné or other cultivated species of Gossypium."

The next paper was one by Worth Hale, of Washington City, upon the standardization of digitalis. This paper, the chair stated, was presented by a member of the staff of the Hygienic Laboratory at Washington, and that the author was not a member of this Association; his paper, however, which was in print, bore upon a very important subject, and had relation to another paper, which would be read. He hardly thought it fair to take up the time of the Section to have it read, under the circumstances, and would entertain a motion that the paper be accepted. This motion was made by Mr. Ladish and seconded by Mr. Hemm, and carried.

FACTORS RELATING TO THE STANDARDIZATION OF DIGITALIS.

BY WORTH HALE.

The question of the activity of *Digitalis purpurea* is almost as old as the use of this drug in regular medicine. A number of different methods, including clinical, chemical and biological methods, have been employed in determining the conditions influencing its activity, and as a result a large number of different factors are commonly cited as determining its variable therapeutic effects. Some of these seem to be very well established, but it must be noted that wide and even diametrically opposite opinions are held concerning them, and this is not to be wondered at, especially when one considers the great number of factors which supposedly alter the action of the different digitalis preparations on the market, and that widely different methods are used in investigating these conditions. It is the purpose of this paper to point out in a general way these various views, the first of which in point of sequence as well as of importance dealing with variability in the crude drug, the second with variability in the finished product.

The country in which drug plants are grown has long been known to alter the amount of their active principles, a variation due not only to climatic conditions but also to variations in the soil. This factor is thought to be of considerable importance in the case of digitalis, and at the present time the English leaves are considered to be best, and these, as well as those from Germany, are believed to be superior to the American-grown leaves. Parenthetically it is to be noted that Bohemian leaves are said to be so toxic that it is necessary in therapeutics to materially reduce the usual amounts given in order to avoid toxic effects. It has been shown, how-

ever, that leaves from the same locality may vary widely in activity not only at different harvests, but, what is equally important, leaves of the same locality and of the same harvest. As an example of these factors, Buffield, using a chemical method, stated that American leaves were more toxic than English, and these in turn more toxic than German leaves. Edmunds, using a biological method, examined three pharmacopœial tinctures made from German leaves and three from English leaves. According to his results the German leaves gave values of 8, 18 and 25; the English leaves, values of 11, 20 and 29. Results so discordant as these certainly throw considerable doubt upon the value of the place of origin of the crude drug as a measure of its activity, although other factors to be considered later probably played an important role in this variability.

A somewhat more generally-established dictum is that digitalis leaves gathered from wild-growing plants are more potent than those growing in gardens, an opinion first promulgated by William Withering, the English physician, who introduced digitalis into regular medicine. This view is generally accepted at the present time, although certain pharmacopœias recognize the cultivated leaf as official. Almost equally well established also is the opinion that leaves gathered from second-year plants are the more active, and that these should be gathered just at the beginning of the flowering season. Subsequent to this the activity of the leaves is thought to be somewhat lessened because of the energy used up in the formation of the flower and the seed. Hart believed as the result of his experiments that the first-year leaves were more toxic than the second year's growth, but this is not the commonly accepted view, and the International Convention recommends leaves of the second year's growth gathered as the plants begin to flower.

A great deal has been said about the deleterious action of certain enzymes which supposedly break up the unstable digitalis glucosides, the process being said to be especially rapid in the presence of heat and moisture. Because of this great care is usually observed in drying the leaves. This deleterious enzyme action is supposed to go on especially at this time. As early as 1807, Hamilton, from his clinical observations, warned physicians against the use of improperly dried digitalis leaves, and a somewhat similar observation was made by Tordes in 1867, who accounted for the greater potency of the digitalis obtained about Strassburg from the fact that after careful selection the leaves were dried in the shade and later in an oven at a temperature of not over 40° C. (94° F.). The value of some such procedure by which the leaves might be dried carefully and more completely has been emphasized by a number of more recent investigations. In most instances moderate heat is used, and it is also suggested that vacuum drying should be used, and that the leaves should be dried over lime, the idea being to reduce the moisture-content to such a degree (1 to 2 per cent. instead of 10 to 15 per cent., as in the ordinary

methods) that the enzyme action would become so slight as to be practically of no importance. And having thus carefully dried the leaves, it has been suggested that they be kept in dark, air-tight containers to prevent further absorption of moisture. It would seem fairly well established that the leaves should be carefully and quickly dried, but certain workers have found that preparations several years old and quite open to the influence of the moisture of the air were well preserved. Others, however, were very weak. At the University of Michigan an assay of digitalis leaves at least eight years old, which had been stored in an ordinary paper bag, showed a high degree of activity and were of about the same value as recently purchased leaves. But in spite of this evidence the careful drying and storing of leaves would seem to be not without importance, although possibly of somewhat less importance than is ascribed to the method by the firm which especially exploits such carefully dried leaves. Nor should it be forgotten, in the effort to dry digitalis leaves quickly, that the active principles of digitalis may be split up by the use of heat in the drying process, and this should therefore be used with caution, if at all.

The digitalis dialysates (made directly from the green leaves) have been suggested as a means of securing preparations in which no enzyme action was possible, and therefore uniform and stable compounds; but biological and chemical investigations have shown that great variation was still to be found, possibly to be ascribed to seasonal variation in the drug plant.

The various methods which are used in preparing the crude drug for medicinal purposes, and the variability in the keeping qualities of these, are also important factors in lessening the chance of securing uniform digitalis products. Little need be said in this place about the pharmacopœial preparations. The tincture and the infusion answer the requirements of the physician, while the fluidextract, which is never used as such, is entirely superfluous. Its most important and about its only use is in the manufacture of what might be termed artificial pharmacopœial tinctures or infusions. No one will deny that the method is simple, but the resulting preparation could never, even by the widest stretch of imagination, be called pharmacopœial, nor is it at all possible that the resulting pseudotinctures or infusions even approximately represent the regular pharmacopœial preparations of the same name. It is therefore somewhat surprising to find that some of the leading manufacturing houses are lending themselves to this practice by stating upon the labels of their fluidextracts, and even of preparations made according to special formulæ, the methods of dilution to secure a pharmacopœial tincture or a pharmacopœial infusion.

The manufacture of special digitalis products in the present unsatisfactory state of digitalis standardization is also a questionable procedure. Of course we all owe a great deal to the manufacturer for discovering and for perfecting the methods by which preparations are made more attractive, uniform and with less secondary action. With a drug such as

digitalis, however, it would seem desirable to decrease rather than increase the number of special formulæ, and the manufacturers would perform a real favor to those suffering from heart disease if they withheld such preparations from the market until careful experimentation and hospital trial has shown them to have not only a real value over the older and official preparations but also to remain unchanged as a result of ageing. At the present time a large part of their value lies in the greater profit to the firm exploiting them, not in a better result to the patient who uses them. In direct line with this it is worth while noting that several such preparations have recently been examined at the Hygienic Laboratory,* and while some were found to be more active than the pharmacopœial preparation, others were very much less efficient; some had no digitalis action upon the heart, and one which had apparently deteriorated badly was directly depressant to it, a result which to say the least would be very disastrous to any one suffering from heart disease.

The knowledge that the crude drug as well as that the preparations of digitalis vary in strength is a result of two general methods of assay, one chemical and the other biological. Because these differ so widely and because of so many modifications in the manner in which they are carried out, it is not surprising that a great many contradictory statements regarding the strength of digitalis have appeared. The chemical method of standardization as used at the present time is based upon the determination of the digitoxin, the most active pure principle found in digitalis leaves. It must not be forgotten however that the chemistry of digitalis is very imperfectly understood; that digitalis owes its activity to at least two other principles, digitalin and digitalein, both of which possess a marked toxic effect upon the heart. Digitoxin assay could therefore give but an incomplete idea of the actual value of the preparation since it is not the only active constituent, and in addition it is not at all likely that the ratio of these various principles always remains the same. The method is also questionable on account of the difficulty with which the digitoxin is estimated. For example, Barger, an English chemist, after adding digitoxin to an artificial tincture was able to recover only 25 per cent. of the amount added.

As a defense of the chemical method, a number of experimenters have compared it with the biological method, but the agreement has been so slight as to give it little apparent value. The most concordant results were obtained by Reed and Vanderkleed, but an analysis of their finding shows a very imperfect parallelism. It may be said therefore in the present state of our knowledge of the chemistry of digitalis that its chemical assay is not of practical value.

It is of interest to note that nearly all investigators of the chemical

* Bulletin 48, U. S. P., H. and M. H. Service, Washington, D. C.

method have used biological methods as a means of controlling the former. This is of course an acknowledgment even by those who urge chemical standardization that biological methods are probably accurate; and to-day this belief is becoming more and more general so that a larger number of manufacturers are adopting some one of several biological methods as a test of the activity of their preparations of digitalis.

An investigation carried out at the Hygienic Laboratory failed to show any absolute parallelism between the various biological methods now commonly used, and it is pointed out that this could not be expected since very widely different animals were used in this investigation and in some cases at least the effect was upon the central nervous system, in others, upon the heart. The important conclusion was that there was nevertheless a general agreement, a preparation assaying weak by one method assaying weak by all.

There can be no doubt of the necessity of standardizing digitalis preparations, the important question being by what method this can best be accomplished. It may be considered axiomatic that the simpler the method the better so long as it shows the value of the preparation examined. The end reaction for such a method should depend upon the therapeutic effect of the drug, and this fact should eliminate all methods of assay in which the toxic effect is mainly upon other organs such as the central nervous system. Frog-heart methods are most commonly used but have been criticised because the heart of cold blooded animals differs so widely from that of man. It must be remembered, however, that experimental tissues such as muscles and nerves have been shown by careful physiological experimentation to react qualitatively alike and therefore the action of digitalis on the frog's heart would probably correspond to a relative action on the mammalian heart. In defense of the use of this animal it is of interest to note that by this method, in an experiment already quoted, less than seven per cent. error occurred in an assay of digitoxin which had been added to a tincture made from hay and chaff. Incidentally too it may be added that 75 per cent. was lost in the chemical estimation of the same tincture.

A very unfortunate condition of affairs militates against the full value of the biological standardization of drugs. In the first place, although such standardization is now carried out by a number of leading manufacturers there is almost no uniformity as to the method used, and in the assay of digitalis at least three general type methods have been used, and each has undergone many modifications either as to the animal used, method of administering the drug, end reaction, etc. Nor is there reason to suppose even if two manufacturers should use the same method that they would adopt the same unit as the standard. One firm might adopt 0.10 Cc. of a tincture of digitalis as sufficient to cause systolic stoppage of the frog's heart in an hour, another 0.15 Cc. and still another 0.20 Cc.

Nevertheless such a difference in a unit could easily be most disastrous to the patient for whom the drug was prescribed and who is really more interested in its uniformity than either the doctor or the pharmacist.

At the present time there is no standard, and as now used biological standardization has little meaning beyond insuring a preparation more or less active and for a given manufacturer probably one of uniform value. But no comparison can be made as to the value of a similar digitalis preparation also standardized physiologically if tested by a different firm. Also without a definite method the whole question of the variability of the crude drug, of the variability due to the use of different formulæ, and after sufficient observation also of their stability after manufacture, must remain unsettled.

It would seem very desirable if the revisers of the next edition of the Pharmacopœia could adopt some method and some definite unit to which all digitalis preparations would conform. Such tests might be made only for the crude drug; but it would seem advisable until we know more definitely about the keeping qualities of the various preparations that they also be standardized, and if deterioration were discovered in these through improper storage or otherwise, that they be withdrawn from the market.

The problem of carrying out such tests as should be decided upon is somewhat difficult since this would probably require some special knowledge of animal experimentation. Manufacturers would necessarily need to make such tests, as many already are doing, before placing their preparations upon the market. Further control might be delegated to the laboratories of the various State Boards of Public Health, to municipal laboratories, and finally the general control might be placed in the hands of the Federal Government which should have general supervision of such standardization and which could best unify and make effective these various agencies for securing uniform and stable digitalis preparations.

The Chair called attention to what he said was an exceedingly interesting paper on the pharmacological assay of the heart tonics, by E. M. Houghton and H. C. Hamilton, of Detroit, which he said would be presented by Mr. John M. Francis, with explanation of the accompanying charts. Mr. Francis therefore gave an interesting verbal abstract of the paper, which he said represented the conclusions drawn from some fifteen years of work on the heart tonics, using several large charts presented with the paper by way of illustration. The full text of the paper here follows:

THE PHARMACOLOGICAL ASSAY OF THE HEART TONICS.

Fifteen Years' Experience.

BY E. M. HOUGHTON, PH. C., M. D., AND H. C. HAMILTON, M. S.

In the early nineties, the possibility of determining the neutralizing value of antidiphtheric serum toward diphtheria toxin by experiments upon

animals was clearly shown by several workers, the method devised by Ehrlich after several years' trial in nearly all parts of the world being finally accepted as the standard method for assaying this serum.

One of us (Houghton) commenced a series of experiments in the autumn of 1894, looking forward to the devising of a suitable method of assay that could be rationally applied for the determination of the value of preparations of the heart tonics. These studies have been continued until the present. During this time several papers have been published (A. M. A., June 9, 1898, and since), calling attention to the method of assay, to the great variation in the potency of these drugs, and to the later results obtained, the last paper in the series being a complete presentation of the subject before the International Congress of Applied Chemistry, London, England, May, 1909 (*Lancet*, June 19, 1909).

The method as presented to the American Medical Association June 9, 1898, for the assay of strophanthus preparations, has been employed continuously since, with very slight modification, and may be described briefly as follows:

1. The pharmacological assay of drugs depends upon the biological fact that the functioning of the cellular protoplasm of animal tissue may be altered in degree but not in kind through the use of drugs which unite with one or more constituents of the protoplasm, such union probably being chemical.

2. Certain drugs have an elective affinity for special animal tissue, which affinity can be utilized for measuring the value of such drugs. The reaction between strychnine and nerve tissue is a noteworthy example.

3. The reaction chosen as a measure for determining tke activity of a given drug should be the most constant and characteristic observable for such. The heart tonics possess a special affinity for the heart muscle, particularly observable when these drugs are administered to frogs, turtles, etc.

4. The kind of animal chosen for making the observation should be the one in which the reaction is most nearly uniform and clearly discernible. In the writers' experience, frogs weighing about 15 grammes each have been chosen on account of their uniformity and the ease with which they can be obtained. (During the breeding season only male frogs should be employed, as at this time the weight of the females is greatly altered by the contained spawn).

5. The animals employed for making an assay of the heart tonics should be of the same species, differing as little as possible from one another in weight and other characteristics, such as length of time kept in captivity, sex, etc., in order that the resistance of the several animals employed for making a test shall be as uniform as possible.

6. The animals employed should be kept under identically the same conditions prior to and during the time they are used for test purposes.

Food, ventilation, moisture, temperature, etc., are important factors in maintaining uniform conditions of experiment.

7. In making a quantitative assay, the strength of the unknown should be compared with the strength of a standard preparation of the same drug, the assay of both being made at the same time and these conditions of the experiment being precisely the same in both cases.

8. The standard adopted should possess the characteristic action of an average preparation of a given drug. Such standard may be obtained by mixing equal parts of not less than ten lots of the finished preparation, derived from the same number of lots of crude drug which have been determined to be of first-class quality by physical and botanical examination.

9. The action of the drug being assayed should, if possible, be compared with the action of the standard upon the same animal.

TABLE I.

OUTLINE OF METHOD OF OBTAINING M. F. D. TINCTURE OF STROPHANTHUS, U. S. P. 1890.

Weight.	Dose per Gm. body weight.	Total dose 1 per cent. sol.	Result.
16 Gms.	.0001	.16	Alive.
15 "	.00015	.23	Alive.
17 "	.0002	.34	Alive.
15 "	.00025	.38	Dead.
16 "	.0002	.32	Alive.
17 "	.00021	.36	Alive.
15 "	.00022	.33	Dead.
16 "	.00023	.37	Dead.
17 "	.00024	.41	Dead.
16 "	.00022	.35	Dead.
17 "	.00022	.37	Dead.
15 "	.00022	.33	Dead.
16 "	.00022	.35	Alive.
17 "	.00022	.37	Alive.
	STANDARD.		
16 "	.00016	.26	Alive.
16 "	.00016	.26	Dead.
16 "	.00016	.26	Dead.
17 "	.00016	.27	Dead.
18 "	.00016	.28	Alive.

Strength of sample is $\frac{.00016}{.00022} = \frac{16}{22}$ of the standard = 72 per cent. = 465 + heart tonic units (H.T.U.'s) per Cc.

10. In those cases where it is impossible to make an assay using a single animal, a sufficient number of animals of as nearly uniform resistance as possible should be employed to rule out any individual idiosyncrasy. In the testing of the heart tonics upon frogs, this is of great importance.

11. Apparatus required for making assays of the heart tonics. Small

wire frog baskets with legs and covers or frog glasses and plates will do, care being taken not to set the baskets too deeply in water and not to fill the plates sufficiently full of water to drown the animals. The water should cover the bottom of the baskets or plates about one-fourth inch. Small balance for weighing the frogs. Volumetric flasks for diluting the preparations to be assayed, and glass pipettes, graduated into hundredths of a cubic centimeter, with long, narrow points, or, better, supplied with hypodermic needle-points for injecting the frogs.

12. The frogs should be handled with much care, avoiding squeezing, pinching, and such while making the injection in the abdominal lymph-sac. The amount of the heart tonic preparation should be very carefully diluted with physiological salt solution, so that the total quantity injected into each frog will be about 0.5 Cc.

13. It is necessary in making an assay of the heart tonics to inject several series of frogs (see Table I).

14. Death of the frog should be the criterion for reading end results, a final examination of the frog being made at the end of twelve hours; those dying prior to the end of the twelve-hour period are considered as killed by the drug, unless some accident has occurred.

15. Ten times the normal minimum fatal dose (M.F.D.) per gram body weight of frog of the standard preparation properly diluted and injected is considered as a heart tonic unit (H.T.U.), consequently the number of H.T.U.'s in a given cubic centimeter of a preparation is one-tenth of the quotient obtained by dividing one by such M.F.D., *i. e.*, the number of H.T.U.'s in each cubic centimeter of fluid is one-tenth of the reciprocal of the M.F.D. To illustrate: If the minimum fatal dose of a given drug per gram body weight of frog is found to be equivalent to 0.01, then the given substance, assuming that it belongs to the group of heart tonics, would contain 10 heart tonic units: (M.F.D. $\frac{1}{0.01} \div 10 =$ 10 H.T.U.'s). This rule can be applied to any of the heart tonics as a means of expressing such values in whole numbers. Definition: A heart tonic unit (H.T.U.) is ten times the normal minimum fatal dose per gram body weight of standard test frogs kept under proper test conditions.

It is to be understood that the H.T.U. is a measure of toxic value, although such toxic values may be translated directly into therapeutic values, based on the U.S.P. average dose or any other dose.

16. Instead of stating the full number of heart tonic units in all cases, round numbers can be used, which do not vary more than a given per cent. from the actual number of units. Reference to Table II shows what may be accomplished.

In actual practice a table can be constructed similar to the above for all the values that will be derived in the testing of the heart tonics under all conditions. These may be printed on a sheet or sheets of paper and kept for reference in a book form or placed on a chart to hang on the wall

of the operation room and used in the same manner as interest or logarithm tables. Such practice would obviate entirely the necessity for the person doing the testing to make mathematical computations unless a correction would be needed, in order to convert an abnormal minimum fatal dose of standard into H.T.U.s as stated below. These variations can also be worked out and converted into tables.

TABLE II.

M. F. D. = normal minimum fatal dose per Gm. body weight of Frog.
H. T. U.s = heart tonic units.

M. F. D.	Exact No. H. T. U.s in 1 Cc.	Approximate No. H. T. U.s in 1 Cc.	Per cent. of Error.
.0001	1000	1000	0
.0002	500	500	0
.0003	333	330	1.
.0004	250	250	0
.0005	200	200	0
.0006	166	160	4.
.0007	142	140	2.
.0008	125	125	0
.0009	111	110	.9
.0010	100	100	0
.0011	91	91	0
.0012	83	80	3.
.0013	77	77	0
.0014	71	70	1.
.0015	66	66	0
.0016	62	62	0
.0017	59	59	0
.0018	55	55	0
.0019	53	53	0
.0020	50	50	0
.0100	10	10	0

17. A correction will be necessary where the minimum fatal dose of the standard is more or less than that mentioned in the table of proposed standard values, such correction to be made as per illustration already cited, Table I. According to the formula, the minimum fatal dose of standard divided by the minimum fatal dose of unknown

$$\left(\frac{\text{M. F. D. of standard}}{\text{M. F. D. of unknown}} = \text{per cent. unknown is of standard}\right)$$

equals the percentage value of unknown. The percentage value of the unknown can easily be converted into H.T.U.s by multiplying the number of H.T.U.s in standard by the per cent. value.

LOSS IN POTENCY OF PREPARATIONS OF THE HEART TONICS WITH AGE.

A. Preparations of Digitalis.

TABLE III.

LOSS OF POTENCY OF DIGITALIS PREPARATIONS WITH AGE.

Prep.	No. sample.	Av. H. T. U.s per Cc. when mfg.	Years later.	Av. No. H. T. U.s	Av. yearly loss per cent.
Extract 94 per cent. Alcohol + 47 per cent. alcohol.	11	260	5	160	8 per cent.
Fl. Ext. U. S. P. 7th Rev.	8	72	6	55	4 per cent.
Fl. Ext. U. S. P. 8th Rev.	11	55	3½	35	10 per cent.
Tincture U. S. P. 8th Rev.	8	7	3	5	9 per cent.

1. Extract of digitalis made by using 94 per cent. alcohol followed by 47 per cent. alcohol as menstruum.

Average potency of eleven samples at the time of manufacture in round numbers contained 260 H.T.U.s per gramme of extract. Five years later the average strength had fallen to 160 H.T.U.s per gramme—a loss of nearly 40 per cent., or about 8 per cent. each year.

2. Fluidextract of digitalis, U. S. P. 7th Rev., 62.7 per cent. alcohol.

Average potency of eight samples at the time of manufacture 720 H.T.U.s per Cc. Six years later the strength had fallen to 550 H.T.U.s per Cc.—a loss of about one-fourth, or 4 per cent. per year.

3. Fluidextract of digitalis, U. S. P. 8th Rev., 48 per cent. alcohol.

Average potency of eleven samples at time of manufacture 550 H.T.U.s per Cc. Three and a half years later 358 H.T.U.'s. Average loss about 10 per cent. yearly.

A very important point should be noted in this connection, namely, the menstruum adopted in the last U. S. P. for the preparation of fluidextract digitalis is much less desirable than the U. S. P. Seventh Revision in at least two respects. Repeated trials show that it is almost impossible to get a finished product containing the full number of H.T.U.'s of the standard we had previously adopted, the average being as above stated, 550 H.T.U.'s per Cc., while with drug of the same quality when the Seventh Revision menstruum is employed no difficulty is experienced. Owing to this it was decided to no longer attempt to assay physiologically the Eighth Revision product and to take such statement referring to it off the label, but, in order to supply the medical profession with a full

strength fluidextract of the drug, it was decided to prepare such with a menstruum containing a larger per cent. of alcohol, which could be assayed and so labeled. In the second place, the loss in potency of the Eighth Revision is about 10 per cent. per year, while with the Seventh Revision it is less than one-half as great, or about 4 per cent. The results coincide quite closely with those following the change made in the menstruum for the fluidextract of squill except that the loss in activity was greater in the latter drug, as pointed out (Houghton in the *J. A. M. A.*, June 12, 1906) three years ago. In this paper several methods of physiological assay showed very clearly that a serious mistake had been made in changing to acetic acid as a menstruum. The writers feel certain that any one who has tried the Eighth Revision menstruum for fluidextract of digitalis has found that it is much less satisfactory from a pharmaceutical point of view, to say nothing of the loss in potency.

4. Tincture of digitalis, U. S. P. Eighth Revision, 48.9 per cent. alcohol.

The average strength of six samples was found to be at the time of manufacture 7 H.T.U.'s per Cc., while three years later the strength had fallen to 5 H.T.U.'s per Cc., or an average yearly loss of 9 per cent. While the number of samples examined may not be sufficient for drawing final conclusions, it seems to us that there is no question about the preparations of digitalis losing strength on standing. The greater the per cent. of alcohol in the menstruum the more stable the product.

TABLE IV.

POTENCY OF PREPARATIONS OF HEART TONICS AS PURCHASED ON THE OPEN MARKET.

Fluidextracts of Digitalis.

No. of manufacturer.	H.T.U.'s per Cc. U. S. P. 7th Rev.	U. S. P. 8th Rev.
1	33	19
	22	
	33	
2	82	
	56	
3	66	33
4	46	
5	46	
6	66	40
	40	
	66	
7	50	
	88	
	50	
8	33	
	33	
9	88	
10	..	13
11	..	26

Average for 17 samples U. S. P. 7th Rev., 53 H.T.U.'s per Cc.
Average for 5 samples U. S. P. 8th Rev., 26 H.T.U.'s per Cc.

English Manufacturers.

12	40
13	33
14	53
15	16
16	50
17	33
18	26
19	30
20	26

Average for 9 samples, 34 H.T.U.'s per Cc.

Tincture of Digitalis, U. S. P.

Standard $\frac{1}{10}$ Potency of F. E. Digitalis.

3	6
2	6

Extract of Digitalis.

Standard 3 Times Potency of F. E. Digitalis.

6	150
	110
2	170

Average, 150 H.T.U.'s per Gm.

F. E. Squill.

1	50	
6	20	
3	41	
28	—	12
11	66	

Average for 4 samples, 44 H.T.U.'s.

Tincture of Strophanthus.

10	—	1200
6	—	1335
22	—	666
1	—	1200
3	400	
		B. P.
23	—	333
14	—	167
24	—	300
15	—	333
25	—	333
26	—	533
13	—	167
27	—	167
1	—	333
6	—	266

Averages, 400, 1200, and B. P. 300, H.T.U.'s per Cc.

The experiments to determine the loss in potency of the preparations of digitalis have not been entirely completed, but the final results will be

published as soon as possible with data relative to the deterioration of the other members of the heart tonic series.

TABLE V.

ASSAYS OF 12 CONSECUTIVE LOTS OF CRUDE DIGITALIS LEAVES SUBMITTED FOR PURCHASE.

Fluidextract Made According to the 7th Revision, U. S. P.

Per cent of standard.	H.T.U.'s per Cc.	Per cent of standard.	H.T.U.'s per Cc.
100	66	75	50
80	50	60	40
120	80	70	46
75	50	100	66
125	82	125	82
200	132	75	50

Average for 12 samples, 66.

Activity compared with the proposed standard: Minimum fatal dose per Gm. 0.0015 Cc. = 66 H.T.U.'s per Cc.

In view of the results we have already obtained, and particularly those regarding the digitalis preparations, we strongly recommend that at the time of manufacture, after proper aging, preparations of digitalis be assayed and a statement be made on the label, stating when the assay was made and the number of H.T.U.'s contained per Cc. Such number of H.T.U.'s should, of course, be the number selected as of standard potency; in other words, hold the finished product to a standard of uniform activity. It would be very desirable for manufacturers in all countries to adopt the same standard, as was recently pointed out and urged by one of us (Houghton, London *Lancet*, June 19, 1909.)

A possible explanation for the loss in activity of preparations of digitalis may be that it is due to a ferment which is not destroyed by the menstruum, as pointed out by Rosenthaler and Meyer; or again it may well be that these products are acted upon in a detrimental way by the soluble constituents in the glass used in the bottles for storing the material (see "Dictionary of Chemical Solubilities," Comey). Certain it is, American glassware varies a great deal in its composition. This strikingly came to our notice in connection with the use of test-tubes for growing cultures of bacteria. In some instances the glass contained sufficient alkalinity to inhibit the growth of the germs entirely. Indeed it has been a source of considerable trouble in our laboratory for many years, so much so that we have found it necessary to carefully test out each lot of glass tubing before it is used for test-tubes for culture media purposes.

It might be thought on considering Table V, since the results check up so closely with the proposed standard for fluidextract of digitalis, that the same figures had been used in both cases. This, however, is not true, as the samples mentioned in Table V were simply worked out in the course of every-day laboratory testing, recorded in a book kept for that purpose,

and were taken off, as intimated, consecutively, merely to illustrate the variability in the activity of crude digitalis leaves as they appear on the market.

TABLE VI.

FLUIDEXTRACT OF DIGITALIS, 7TH REVISION.

No.	M. F. D.	Units.
5	.0008	125
3	.0009	125
2	.00095	105
4	.0010	100
4	.0011	91
8	.0012	83
7	.0013	77
8	.0014	71
10	.0015	66
4	.0016	62
2	.0017	58
5	.0018	55
2	.0019	52
6	.0020	50
2	.0021	47
2	.0022	45
1	.0024	41
1	.0027	37
2	.0030	33
1	.0031	32
1	.0032	31
1	.0035	28
1	.0066	15
1	.0075	13

Summary—Fluidextract of Digitalis, 7th Rev.

	M. F. D.	H.T.U.'s per Cc.
Standard adopted in 1898	.0015	66
Average for 83 samples tested since 1901	—	70
Proposed standard for 7th Rev. U. S. P	—	65

TABLE VII.

FLUIDEXTRACT OF SQUILL, SEVENTH REVISION.

No.	M. F. D.	Units.
1	.0006	166
2	.0007	142
6	.0008	125
2	.0009	111
10	.0010	100
7	.0011	91
7	.0012	83
2	.0013	76
4	.0014	71
4	.0015	66
2	.0016	62
1	.0018	55
1	.0019	52
1	.0022	45
2	.0024	41
1	.0025	40
1	.0032	31
1	.0035	28
1	.0038	26
1	.0040	25
2	.0050	20
1	.0056	17
1	.0065	15

Summary—Fluidextract of Squill, U. S. P. 7th Rev.

	M. F. D.	H. T. U.'s per Cc.
Standard adopted in 1901	.0012	83
Average for 61 samples	——	80
Proposed standard for 7th Rev. U. S. P.	——	80

These figures were derived in a manner similar to that used for the derivation of the minimum fatal dose for the standard tincture of strophanthus, as previously stated. Reference to the following synopses dealing with strophanthus, digitalis, squill, and convallaria shows how accurately these figures correspond with the results obtained in routine practice in a large manufacturing laboratory. The averages indicate the actual results obtained on all the samples of the preparations tested since the year 1901. The records for the previous five years were unfortunately destroyed in a fire that we had in our laboratory in 1903; consequently the figures for that period are not available. It should be observed that the figure for the standard tincture of strophanthus was given in the paper published in 1898, and that it closely approximates with those derived from the assay of 134 samples of tincture of strophanthus tested, as stated, since the year 1901.

TABLE VIII.

FLUIDEXTRACT OF CONVALLARIA (RHIZOME AND ROOTS), 7TH AND 8TH REVISIONS.

No.	M. F. D.	Units.
2	.00014	714
1	.00015	666
1	.00018	555
2	.00020	500
1	.00021	476
3	.00022	454
5	.00024	416
1	.00025	400
2	.00026	384
1	.00027	370
1	.00029	344
1	.00031	322
1	.00032	312
1	.00033	303
1	.00034	294
1	.00036	277
2	.00039	256
2	.00040	250
1	.00045	222

Summary—Fluidextract of Convallaria: Rhizome and Roots.

	M. F. D.	H. T. U.'s per Cc.
Standard adopted in 1900	.00025	400
Average for 30 samples	———	406
Proposed standard	———	400

TABLE IX.

FIVE PER CENT. TINCTURE OF STROPHANTHUS, U. S. P. 1890.

No.	M. F. D.	Units.
11	.00011	909
12	.00012	825
9	.00013	769
11	.00014	714
20	.00015	666
21	.00016	625
7	.00017	588
15	.00020	500
9	.00030	333
11	.00040	250
8	.00050	200

Summary—Tincture of Strophanthus, U. S. P. 1890 (5 per cent.).

	M. F. D.	Units.
Standard adopted in 1897	0.00015	666
Average for 134 samples tested since 1901	0.000167	598

Proposed standard U. S. P. 1900, Tr. 10 per cent., 1200 H.T.U.'s per Cc.
(See also Table VII.)

TABLE X.

STANDARD TINCTURE OF STROPHANTHUS 5 PER CENT., U. S. P. 1890.

M. F. D. Tincture Strophanthus, prepared from samples of drug bought on American market.

1	.00015	8	.00015
2	.00026	9	.00022
3	.00015	10	.00017
4	.00012	11	.00016
5	.00013	12	.00015
6	.00015	13	.00025
7	.00010	14	.00033

(Presented before A. M. A., June, 1898.)

Average M. F. D. = .00017 = 588 H. T. U.'s per Cc.
Standard proposed for U. S. P., 7th Revision = 600 H. T. U.'s per Cc.
Standard proposed for U. S. P., 8th Revision = 1200 H. T. U.'s per Cc.
(See also Table I.)

TABLE XI.

PROPOSED STANDARDS FOR THE MOST IMPORTANT PREPARATIONS OF THE DIGITALIS SERIES OF THE HEART TONICS.

	M. F. D.	Exact No. of H. T. units per Cc.	No. of H. T. units in round numbers per Cc.
Digitalis—Fluidextract, U. S. P. 1890	.0015	66	65
Solid Extract	.0005	200	200
Tincture, U. S. P. 1900	.025	6	6
Digitalin (Germanic)	.00005	2000	2000
Squill—Fluidextract U. S. P. 1890	.0012	83	80
Strophanthus—Tincture U. S. P. 1900	.0000833	1200	1200
Convallaria—Fluidextract:			
Rhizome, and Roots, U. S. P.	.00025	400	400
Herb	.00015	666	650
Flowers	.00009	1111	1100

GENERAL CONCLUSIONS.

It seems to us we are warranted in concluding, since the chemical assays of the heart tonics of the digitalis series has been so thoroughly demonstrated to be unreliable, that some method of pharmacological assay must be adopted in order to safeguard the therapeutic application of these products.

Nearly fifteen years' experience has shown that the method proposed gives reasonably accurate results.

For the fluidextract of digitalis and the fluidextract of squills, U. S. P., 8th Revision, we do not feel warranted at this time in proposing a standard for activity, as we have found that the menstruums proposed for these products do not completely exhaust the drug.

We believe it wise to adopt a heart tonic unit (H. T. U.) which is ten times the normal minimum fatal dose per gram body-weight of standard test frogs kept under proper test conditions.

The standard of physiological activity should be equal to the average value of the given preparation, determined at the season of the year when the most uniform results may be obtained. Best established, as in the case of the standards proposed, by comparison of the results obtained during the several years' testing.

It is recommended that the number of heart tonic units per cubic centimeter be placed on the label of each preparation at the time it is tested and finished for placing on the market, also the date of manufacture.

The authors realize that it may be possible and desirable with added knowledge as the result of laboratory experiments, to improve the method of assay proposed. It is believed, however, that strict adherence to the method of assay and proper labeling as outlined will result in more uniformly active products of this class, as they appear on the market, and safeguard their therapeutic use.

The Chair stated that this communication was one of exceeding great value, and it was unfortunate that the Section did not have more time to give to it. Mr. Houghton made two particular points, he said, one the selection of animals and the other the basing of determinations upon too small a number of experiments; these points should be brought out as strongly as possible. He invited discussion, but none was offered.

The next paper to which attention was invited was one on "Tetanus Antitoxin," by J. F. Anderson, of Washington City, who, the Chairman stated, had worked at the standard that had been adopted by the United States government. The General Secretary said that, inasmuch as the author was not a member of this Association, he would like to move that the paper be received and published in the Proceedings, and this motion was seconded by Mr. Asher and carried. The text of the paper here follows:

WHY TETANUS ANTITOXIN SHOULD BE IN THE U. S. P.

BY JOHN F. ANDERSON,
Assistant Director, Hygienic Laboratory, U. S. P. H. & M.-H. S.

As a result of the adoption of an American standard for measuring the strength of diphtheria antitoxin by the U. S. Public and Marine-Hospital Service, the Eighth Decennial Revision of the Pharmacopœia included antidiphtheric serum, and made the American unit the Pharmacopœial standard of potency.

On Oct. 25, 1907, the same service as a result of work done in the Hygienic Laboratory promulgated an American standard unit for tetanus antitoxin. All tetanus antitoxin manufactured and sold in interstate commerce in the United States is required to be standardized in accordance with this unit. The unit may be defined as follows:

"The immunity unit for measuring the strength of tetanus antitoxin shall be ten times the least quantity of antitetanic serum necessary to save the life of a 350-gram guinea pig for ninety-six hours against the official test dose of a standard toxin furnished by the Hygienic Laboratory of the Public Health and Marine-Hospital Service."

The great need of an official standard for tetanus antitoxin had been long felt by all producers of this serum. Before the adoption of the American standard there were as many methods of measuring the potency of tetanus antitoxin in the United States as there were producers. The druggist in selling a package of tetanus antitoxin, or the physician in using the same, before the adoption of the official standard had no real idea of its antitoxic power, as one maker's product might be labeled "to contain 6,000,000 units per Cc.", and another "0.75 units per Cc.", when, in fact, according to the official standard, the first had only 90 units per Cc. and the latter actually over 700 units per Cc.

An act of Congress approved July 1, 1902, entitled "An act to regulate the sale of viruses, serums, toxins, and analogous products, etc.," imposed upon the Surgeon-General of the U. S. Public Health and Marine-Hospital Service, under direction of the Secretary of the Treasury, the supervision and control of the manufacture and interstate sale of these important therapeutic agencies. Briefly this control is exercised as follows:

In accordance with the act of Congress above referred to and the regulations framed thereunder, all persons and establishments engaged in the manufacture and interstate sale of viruses, serums, toxins, and analogous products are required to be licensed by the Secretary of the Treasury, upon recommendation of the Surgeon-General, after a sanitary inspection has been made of their establishments, methods and products.

An inspector visits the establishment and examines carefully the sanitary condition of the buildings, the condition of the animals used for the production of serum, the technic, such as methods of bleeding, collecting and storing the serum, and especially the methods used in measuring the strength of their product. He sees as to the labeling of the product, paying especial attention to the date when the serum is labeled to be exchanged He also takes samples of their various products, which are forwarded to the Hygienic Laboratory for examination.

Upon the results of the examination of these samples, and his inspection of the establishment are based his recommendation for or against a license for the particular establishment.

After a firm has been licensed to engage in the manufacture and interstate sale of these products, samples of their products are bought at frequent intervals in various parts of the country and examined in the Laboratory. The samples are examined, first, as to labeling; second, as to potency of the product: third, as to sterility and the presence of toxins; fourth, as to amount of preservative.

If the samples are found to be deficient in any of the above particulars, the matter is at once reported to the Surgeon-General, who, in the case of lack of potency, contamination, or excessive amount of preservative, requires the manufacturer to withdraw from the market that particular lot of serum.

Since April 1, 1905, many samples of serum have been examined in the Hygienic Laboratory, and of this number only a very few have been found to be below strength or to contain a less number of units than labeled, or to have bacterial contamination.

The great advantage of this strict control over these products to the physician, and consequently in the control of the various diseases for which they are used, is of course very manifest.

Now the physician when he buys a package of diphtheria or tetanus antitoxin labeled to contain 1,000 or 2,000 units, as the case may be, can be absolutely sure that his patient will get at least that number of units.

Tetanus antitoxin is in the Belgian, French, and Swiss Pharmacopœias, and should certainly be included in the next revision of the Pharmacopœia of the United States. Its great value as a prophylactic without regard to its curative action in developed tetanus, and the fact that there is now an official standard, entitle it to admission.

By being admitted to the Pharmacopœia, which contains the standards for therapeutic products, definite directions as to the methods of preserving the serum, total solids, physical appearance, etc., can be made. All antitoxic sera deteriorate by age; this deterioration is less and more gradual when the sera are kept under proper conditions as to light and temperature. Sera kept at room temperature suffer a loss in antitoxin potency of from 10 per cent. to 30 per cent. in 12 months, while when kept in the ice chest the loss may vary from 0 per cent to 5 per cent. or 10 per cent.

A paper on "Alcohol and Alcoholic Beverages," by M. I. Wilbert, was received and referred to take the usual course.

ALCOHOL AND ALCOHOLIC BEVERAGES IN THE U. S. P.

BY M. I. WILBERT.

The present-day agitation for the further control, restriction and possible abolition of the use and consequently the production and sale of alcoholic beverages, makes a study of the economic conditions involved an unusually interesting one.

From a pharmaceutical point of view the problems involved in this present agitation are still further complicated by the fact that some of the more widely used alcoholic beverages have, in more recent decades, been accorded a place in the Pharmacopœia of the United States, and are still widely, if not frequently, used for medicinal purposes.

Leaving aside the question of the propriety of recognizing some and not

all of the alcohol-containing liquids that are sold and used, and not even entering upon a detailed discussion of the propriety of recognizing any of the substances that can or are used for beverage purposes, it may be interesting to consider in a general way the gradual evolution of the several substances as official, pharmacopœial articles. The information is perhaps most satisfactorily presented in the form of a table, and such a table will also serve to illustrate, to a very marked degree, the influence of commercialization on the standards included in the Pharmacopœia.

As would be expected, from its widespread use as a solvent, a definition for alcohol has been included in every Pharmacopœia so far published in this country, and this definition is usually accompanied by limitations and tests. Wine, in some form, has also been included, largely, perhaps, because of its being used as a menstruum in connection with medicinal wines. With the advent of pharmacists as members of the Committee of Revision, other alcohol-containing liquids were included, and the definitions for the previously recognized substances were gradually enlarged upon and elaborated.

Looking back for a moment over the intervening period to the early days in American medicine, it may perhaps be permissible to recall some of the practices in connection with the use of alcoholic beverages for medicinal purposes.

Distilled spirits was probably known to the early Chinese, but our present knowledge of this product appears to begin with the Arabians of the 11th or 12th century. Raymundus Lullus, in the 13th century, introduced alcohol as: "Ultima consilatio corporis humani," but the use of all forms of distilled spirits for medicinal purposes, at least in this country, appears to have been limited, and some form of wine was usually given in preference. Thus Bigelow, in his treatise on the Materia Medica intended as a sequel to the Pharmacopœia of the United States, asserts that "The stimulating properties of wine depend upon the alcohol which it contains, and which may be separated from it by distillation. The alcohol, however, is so modified by its combination with the other ingredients of the wine that its intoxicating effects are much less in the state of wine than in the state of spirits."

The diet list contained in the Pharmacopœia of the New York Hospital, 1816, indicates that "spirits, beer, or wine" may be prescribed by the physician or surgeon, and that the latter in various forms, such as "wine whey, mulled wine, spiced wine, the discreet use of wine with water, a glass drank pure now and then by convalescents and patients extremely debilitated, or taken as a vehicle for Peruvian bark, and an accompaniment for other medicines. Ale, beer, and porter in due proportion, and under suitable directions as to quantity and repetition. Spirits cautiously ordered and carefully administered, according to the habits, exigencies, and symptoms of the patient with such other nutritious articles as the

judgement of the prescriber may direct," constituted an important part of the directions for "full diet."

Thacher, in the American New Dispensatory, asserts that "from continued use of spirituous liquors many diseases have their origin." This observation or belief that the use of ardent spirits was the direct cause of disease appears to have been widespread; it was certainly commented on by many medical writers of the early decades of the 19th century. Even the excessive use of wine was warned against. John Redman Cox, in the American Dispensatory, asserts that "wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess it produces inebriety, which is often succeeded by headache, stupor, and diarrhœa, which lasts for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremors, and cutaneous affections."

Dr. Geo. B. Wood, in an article on the great temperance movement which swept over this country some three-quarters of a century ago, discusses the then widespread use of ardent spirits for beverage purposes, and pictures at some length the excesses which were so evident during the early decades of the 19th century. He also points out the possible dangers to the body politic from the debasing effect upon individual character of the continued use of strong liquor.

Now as then it is generally conceded by medical men that alcoholic liquors are seldom required in the treatment of disease, and that when they are used they are likely to be more detrimental than salutary, and may perchance prove to be highly injurious, irrespective of the nature or age of the liquor used.

A review of the definitions that have appeared in connection with the official liquors will readily show that the revision committees, in succeeding decades, differed quite widely on the nature and kind of wine or liquor to be used, thus the official title of white wine has indicated Malaga, sherry, and a native, dry, white wine. Brandy was originally limited to the distillate from French wine, as indicated by the official title, but for nearly half a century this official title has been a misnomer as the official definition permits the use of any "alcoholic liquid obtained by the distillation of the fermented unmodified juice of fresh grapes." Official whiskey has varied somewhat in name and nature. It was formerly required to be two years old, and is now required to be at least twice that age. In connection with the several requirements it may be pointed out that as yet it has not been definitely proven that a four-year-old whiskey has any appreciable advantages, as a medicine, over the corresponding liquor two years old, or a neutral proof spirit fresh from the still; nor is there any experimental evidence to show that either or both

of the distilled liquors, now official, have any advantages, medicinally, over other forms of distilled spirits, or that the wines described in the U. S. P. are in any way superior to other fermented fruit juices or to malt liquors containing an equivalent amount of alcohol.

It has long been recognized that alcohol-containing beverages constitute a favorite field for adulteration, and it is questionable indeed if any pharmacopœial description that can be devised could furnish chemical tests sufficiently explicit to insure a really pure article. As an illustration of the evolution of the art of adulterating liquors, it may be pointed out that there is a record of a patent granted in February, 1803, for a "method of making brandy out of all kinds of grain or fruit, equal in flavor, taste and color, to the best imported French brandy." Since this early date the adulteration of liquors has developed into a fine art, and to-day manufacturers of artificial whiskey and brandy boldly assert that the advances that have been made in the "improving" of alcoholic liquors have been such that the consumer actually prefers the "synthetic product," and that practically all of the wines and liquors sold have been "improved" to meet the demands of the consumer.

In conclusion let me briefly recount to you a few reasons why brandy, whisky, and red wine at least should be deleted from the Pharmacopœia.

1. They are not distinctly valuable medicinal agents.

2. They are not necessary in the production of official medicinal preparations.

3. The sale of alcohol, brandy, whisky and wine is restricted by Federal and state laws to dealers in alcoholic beverages, and cannot be engaged in, legally, by other than a licensed vendor.

4. The preparation and sale of medicines is provided for by special regulations exempting druggists from the payment of special tax.

5. At the present time the Internal Revenue Department adequately provides means by which the consumer can assure himself of the identity and nature of the whisky he buys, and the same department could, if necessary, extend this provision over other branches of the liquor trade, and thus assure a much more uniformly pure and reliable article than can be secured by any possible collection of physical and chemical tests.

In brief the official descriptions for brandy, whisky, and red wine are incomplete, misleading, unnecessary, and tend to debase pharmacy into an adjunct of the liquor trade. Their presence has never been a credit to the Pharmacopœia, and the sale of liquors for medicinal use has never been anything but a curse to the individual druggist or to the profession as a whole.

TABLE SHOWING THE EVOLUTION OF ALCOHOL AND ALCOHOLIC BEVERAGES AS OFFICIAL SUBSTANCES.

	Alcohol.	Whisky.	Brandy.	White Wine.	Red Wine.
Pharm. Mass. Med. Society.	Alcohol, sp. gr. 0.835. Alcohol dilutum, sp. gr. 0.935.			Vitis Vinifera. (Spanish White Wine.)	
U. S. P., 1820.	Alcohol, sp. gr. 0.835.			Vinum. (The sort called Teneriffe.)	
New York U. S. P.	Alcohol. Including Prop. and Med. Oper.			Vinum.	
Philadelphia U. S. P., 1830.	Alcohol, sp. gr. 0.835.			Vinum. (The white wine called Teneriffe.)	
U. S. P., 1840.	Alcohol, sp. gr. 0.835.			Vinum. (Sherry Wine.)	
U. S. P., 1850.	Alcohol, sp. gr. 0.835.		Spiritus Vini Gallici. (From French Wine.)	Vinum Album. (Sherry Wine.)	Vinum Rubrum. (Port Wine).
U. S. P., 1860.	Alcohol, sp. gr. 0.835. Alcohol dilutum, sp. gr. 0.941. Alcohol fortius, sp. gr. 0.817.	Spiritus Frumenti.	Spiritus Vini Gallici. (Spirit from fermented grapes.)	Vinum Xericum.	Vinum Portense.
U. S. P., 1870.	Alcohol, sp. gr. 0.835. Alcohol dilutum, sp. gr. 0.941. Alcohol fortius, sp. gr. 0.817.	Spiritus Frumenti.	Spiritus Vini Gallici. (Spirit from fermented grapes.)	Vinum Xericum.	Vinum Portense.
U. S. P., 1880.	Alcohol, sp. gr. 0.820. Alcohol dilutum, sp. gr. 0.928.	Spiritus Frumenti. (Whisky.)	Spiritus Vini Gallici.	Vinum Album. Vinum Album Fortius.	Vinum Rubrum.
U. S. P., 1890.	Alcohol, sp. gr. 0.820. Alcohol absolutum, sp. gr. 0.787. Alcohol deodoratum, sp. gr. 0.816. Alcohol dilutum, sp. gr. 0.936.	Spiritus Frumenti. (Whisky.)	Spiritus Vini Gallici.	Vinum Album.	Vinum Rubrum.
U. S. P., VIII.	Alcohol, sp. gr. 0.816. Alcohol, sp. gr. 0.797. Alcohol dilutum, sp. gr. 0.936.	Spiritus Frumenti. (Whisky.)	Spiritus Vini Gallici.	Vinum Album.	Vinum Rubrum.

The Chair stated that the Section had now reached the point of a one-hour's discussion of the report of the Committee on U. S. Pharmacopœia, provided for in the program, and that Mr. Hallberg was designated to lead off in that discussion. He invited the gentleman to proceed.

Mr. Hallberg began by saying that, in the absence of Chairman Beringer, of the Committee, the report had been sent to him for presentation, and he had gone over it and would like to read some of the general principles aunounced; then whatever detail might be considered of interest and desirable to go into could be presented. He said he would certainly not take over thirty minutes in his presentation, and might take less. He then presented the report in rather full abstract, especially as to certain portions of it, the full text thereof being as follows:

REPORT OF THE COMMITTEE ON UNITED STATES PHARMACOPŒIA.

The masterpiece of to-day becomes to-morrow but the imperfect model for a higher ideal. The ambitious and progressive physician or pharmacist ceases his labors for progress only with his breath, and the ever-present desire and effort to improve is one of his noticeable attributes. The scientific student, in his search for the truth, is continuously discovering flaws and defects, evidences of the imperfection of human thought and handiwork. Pharmacopœial revision is largely the result of criticisms, and the present report is composed mainly of critical comments and suggestions, each one of which is designed to be of some service in the improvement of the next revision.

However, the work of this Committee of the American Pharmaceutical Association should not be restricted to criticism, but it should be constructive as well. We should endeavor to anticipate the work of revision, and in our reports offer suggestions for proposed improvements and innovations as debatable questions in order to encourage discussion and secure the opinions of as many as possible, and all the information available on such subjects.

The Committee should be continued and so constituted as to co-operate with and render efficient assistance to the Committee on Revision of the U. S. P. in collating, in the construction of formulas, in experimentation and investigation, provided such assistance be acceptable to the Committee on Revision. With this idea in mind, the Chairman, early this year, formally made the proffer of the good offices and services of this Committee to the Chairman of the Revision Committee, and requested reference of such problems or work that might be undertaken to the benefit of that body.

It has likewise been suggested that a plan of co-operation and interchange of views and work could be arranged with the similar committees of the American Medical Association and the National Wholesale Druggists' Association, and so advances were made to the chairmen of these respective committees to see if such plan was feasible and to learn if there was a mutual desire for such co-ordination. This plan for co-operative work between committees of such representative bodies is ideal, but it must receive further consideration, and its consummation must he preceded by an earnest, mutual desire.

In the preparation of a composite report of this character, presenting in some cases comments and views that are individual, and in others those that are held more or less in common, the Chairman is confronted by a peculiar difficulty. Since some of the reports and suggestions have been very recently received, it was not possible to carry out the intent of submitting the entire report of the committee for consideration in advance of the meeting. However it is exceedingly doubtful, if discussion, necessarily by correspondence, would have harmonized our views on some of the points. Conse-

quently, it was decided to incorporate whatever it was possible to include and to indicate at the close of each comment the author thereof. This plan, likewise, serves to give credit to each colleague.

GENERAL TOPICS AND SUGGESTIONS.

The Preface.—The preface of the pharmacopœia has become important since it contains not only much that is explanatory, but also lays down certain rules and regulations that become part of the law along with the recognition of the entire work as a legal standard, and so its statements are worthy of study.

Percentage of Moisture.—The paragraph on page xxxviii limiting the percentage of moisture in non-hygroscopic crystallized chemicals to a 3 per cent., and providing that powders, capillary crystals (does this include granular salts?) and all hygroscopic salts are to be dispensed in a condition of sensible dryness, needs careful consideration and revision. (Beringer.)

Botanical Authorities.—The statement on page XLI "that in many cases Englar and Prantl have been followed as authorities" is misleading and is open to misconstruction. Certainly the general views and promiscuous writings of these botanists are not referred to, but that their joint great work in connection with other botanical monographers and authorities, "Natürliche Pflanzenfamilien," is intended. In the next revision it is suggested that this be accepted in *all*, and "not followed in many cases," or to be more specific, that Englar and Prantl, "Natürliche Pflanzenfamilien," be accepted and followed as the authority for botanical classifications and the limitations of genera. (Beringer.)

Scope and Policy of the U. S. Pharmacopœia.—"The real and immediate interests of physicians and retail druggists should not be overshadowed by those of the large manufacturers, importers, food officials and others, who desire the pharmacopœia to be almost a universal standard for chemicals."

"It is to the best interest of the members of this Association that the U. S. P. continue to be what its founders intended it, viz., a medium of communication between the prescribing physician and the dispensing pharmacist."

"It should not be made a standard for drugs which the retail pharmacist is not called upon to dispense except in so far as the quality of the preparations which he does dispense is directly dependent upon the quality of the crude drugs."

"It should not be a standard for articles, the chief uses of which are those of foods, beverages, or flavoring agents. When such are used to some extent in the preparation of medicines or as vehicles, the U. S. P. should accept the recognized standards with the modification which may be desirable from a pharmaceutical or medical standpoint. The U. S. P. should not be the primary standard for such preparations. The standards for the latter should be prepared by the Federal and State officials engaged in the enforcement of pure food laws."

"It is to the interest of this Association that the Pharmacopœia be made to meet as nearly as possible the present-day needs of the medical profession. Hence we believe that full cognizance should be taken of the fact that the science of medicine is international and that every effort should be made to make the U. S. P. correspond as closely as practicable—in strength of preparations, nomenclature, etc.—to international usage." (Hunt)

NOMENCLATURE.

"The instructions to the Committee on Revision by the last decennial convention were: 'General Principles to be followed in revising the Pharmacopœia.' On nomenclature 'it recommended that changes in the titles of articles at present official, be made only for the purpose of insuring greater accuracy or safety in dispensing. In the case of newly admitted articles, it is recommended that such titles be chosen as are in har-

mony with general usage and convenient for prescribing: but in the case of chemicals of a definite composition a scientific name should be given, at least, as a synonym.'"

It is believed that these instructions are so sound that they are not likely to be radically altered, at least during the next decennium.

Botanical.—While it leads to accuracy to designate the official part of the plant in the title, it is scarcely necessary except of course when more than one part of the same plant is, or has been, in general use.

Chemical.—The chemical nomenclature appears satisfactory; the principal discussion concerning the orthography and the terminology. The retention of "calx" is believed to be justifiable, especially owing to the simplicity of its genitive for liquor calcis, etc., instead of liquor calcii hydroxidi.

A distinction in *ous* and *ic* compounds of Fe and Hg would be desirable in the latin titles, for example, ferro sulphas, ferro carbonas; hydrargyro chloridum mite, hydrargyro iodidum flavum; *Ferroso* and *hydrargyroso* have been used, but the first mentioned form is preferred unless is is thought it would violate rules of grammar.

Titles for Synthetic Compounds.—These present the greatest difficulty, since the U. S. Pharmacopœia has not adopted the trade names for any of these except antipyrine, after it became free, and the full chemical names would, as a rule, be too complicated and inconvenient for use.

The compromise in the last revision whereby the titles are formed through a contraction of the chemical name has been much criticized, yet it is believed, that this is the best result that could be obtained under the circumstances. If the trade name is otherwise not objectionable it is believed that it should be used, and the latin titles be adapted from it as soon as the trade name becomes free.

ANTIPYRINE should be antipyrinum rather than antipyrina, but the title is objectionable and is wrong, since it is not an antipyretic and should be changed to phenazonum (Br.).

PHENACETIN is too well established to be superseded by acetphenetidin and should be adopted.

SACCHARIN is a misleading term and should never have been accepted. While it has been tolerated a long time it should be superseded by benzosulphinide (U. S.), which fairly expresses its origin and properties.

SALOL may well be left as phenyl salicylate, which characterizes it.

It is believed that the U. S. titles for the two sulphone compounds cannot be improved on. The extra ethyl group introduced into sulphone methane (Sulfonal), explains as clearly as is possible why sulphone-ethyl-methane (Trional), is less depressing than the sulphonal with one less ethyl group in its constitution.

It is recommended that the same method be followed in naming new compounds, *i. e.*, a contraction of the true chemical name as short and euphonious as possible.

The question of retaining the present orthography and the *e* termination except in neutral principles and glucosides has been referred to a special committee for conference with the A. M. A. and the American Chemical Society.

ADEPS LANAE has never been accepted and causes confusion since the "Hydrous" kind is nearly always desired when ordered by prescription. In the French, Swiss and Swedish Pharmacopœias, "Lanolinum" is used to describe the adeps lanae hydrous and this is recommended as preferable.

The practicability of the separation of the extracts from fluidextracts suggests a similar separation of the volatile oils from the fixed oils. The French Pharmacopœia accomplishes this by naming the volatile oils "Essences" in the alphabetic arrangement, though retaining the Latin "Oleum" with a suffix etherea; the Swedish Pharmacopœia has the etherea adjective immediately preceding oleum thus "Aetheroleum citri" which makes a complete separation of these two entirely different substances.

It is recommended that the volatile oils be called "Etherolea," the term "Olea" being retained for the fixed oils.

Pharmaceutical Preparations.—The nomenclature of the pharmaceutical preparations, *i e.*, such for which formulas are given in the Pharmacopœia is satisfactory; criticism having been offered only on the following:

Liquor Antisepticus, Pilulæ Catharticæ Comp., Pilulæ Catharticæ Vegetabiles, Pilulæ Laxativæ Comp.

There can be no objection to any of these except possibly in the last mentioned, which containing strychnine, should be named in the title. The others are objectionable only to those who are hypercritical, and the same may be said of Mistura Glycyrrhizæ Comp. in that containing a little opium, this is not stated in its title. For such compound preparations it is difficult to formulate titles that will comprise all the principal ingredients. These titles are so well known, moreover, that any change in them would be resented. (Hallberg, Eberle, Mittelbach.)

Titles and Synonyms.—In the light of existing food laws and regulations that decree that on the label "the nomenclature of the Pharmacopœia shall obtain" the subject of correct Latin titles, English names and synonyms should receive most careful consideration and revision as this phase of the law has a direct bearing on every trade transaction.

The rule on synonomy as stated on page xli and the index treatment of synonyms adopted in the U. S. P. VIII is not satisfactory, and it is recommended that the Latin titles be such as are used by physicians in prescription writing, *if correct*, and that English names or equivalents be selected that will serve as proper and useful trade names. Also that a list or table of synonyms be included in the next revision. (Beringer).

The word "Official."—By legal enactment the word official is no longer limited to "synonymous with pharmacopœial," but is equally applicable to the National Formulary and articles contained therein. While both are now legally "official," in that they are both authoritative, it is nevertheless still desirable to have a means of designating pharmacopœial, and it is recommended that the word "*officinal*" be reinstated in the Pharmacopœia and pharmaceutical literature for this purpose.

When one compares the etymology of the two words, the difference in the meaning will be understood. "Official" is derived from the Latin *officium*, service, duty, office and "officinal" from the Latin "*officina*," a laboratory or shop, and was especially applied to an apothecary's shop, and to these substances and medicines which are directed in the Pharmacopœia to be kept in apothecaries' shops. Such has been the use by scientific writers and scholars for several centuries, and still remains the dictionary meaning given for officinal, and it should be officially reinstated in the Pharmacopœia." (Beringer.)

Descriptions of Galenicals.—"While the Pharmacopœia has appended to each organic drug and chemical recognized a description of the physical properties, it has not extended the method to descriptions of the products of the formulas given for galenicals. In several of the foreign pharmacopœias each formula is followed by a terse description of the material characters of the product. This plan is believed to have a practical value to both pharmacists and physicians, and it is an innovation that should be judiciously introduced in the next revision." (Beringer.)

Fineness of Powders.—It may be stated, almost as a rule, that the degree of comminution directed in the official formulas, is too fine for percolation on a more extensive scale, and the manufacturer working on larger quantities must be guided by experience and judgment in powdering his drugs. The requirement that the powdered substance "must be uniformly of the fineness directed" is also frequently impractical. It is not possible to grind up some drugs to a uniform powder, because certain portions may be

reduced readily to a fine powder and other portions be reduced with difficulty to even a coarser powder. Neither of these portions can be rejected, as an even mixture of all is necessary to properly represent the drug.

In this connection, there is a peculiar break in grammatical construction in the definition of a very fine powder on page XLIX, where it is predicated of "a very fine powder that it should pass through a sieve having 80 or more meshes to the linear inch (30 to the Cm.), and should be made from gauge No. 38 wire." It is evident that "the sieve" must be introduced before the second "should," to carry the intended meaning This same "bull" appears in each of the four subsequent paragraphs defining the degrees of fineness of powders. (Beringer.)

"The definitions of powders should be so worded that a No. 60 powder would not also be a No. 40 as well as a No. 20 powder." (Havenhill.)

Percolation.—The process of percolation is well and tersely described in the "Introductory Notes," and the instructions given are applicable and can be readily carried out by the pharmacist working on the quantities directed in the official formulas, and the general method and procedure can be followed by the larger manufacturers with such modifications as are necessitated by working on a larger scale. The "specified quantity of menstruum" for moistening is not always satisfactory. This must vary with the variation in moisture contained in the drug, and is likewise influenced by atmospheric conditions. The practical pharmacist moistens by mixing small portions of the menstruum until a handful of the moistened drug retains on pressure the form of the palm and fingers, and yet readily falls apart on releasing the pressure. The incorporation of such a simple, practical instruction would save repetition in numerous formulas. (Beringer.)

Official Processes for Determining Chemical Characteristics and Physical Constants.—Chemists working by different methods will frequently obtain varying results, even in some of the simple determinations. As the Pharmacopœia is now the legal standard, whose requirements will have to be met, there will constantly arise disputes over such discrepant results in testing drugs and medicinal and chemical products. Hence it is recommended that the Pharmacopœia should adopt official methods to be followed in legal investigations of all such products for determining specific gravity, ash, melting point, congealing point, boiling point, solubility, alcohol content, ether content, solid ingredients, aqueous extract, alcohol extract, ether and petroleum ether extract, sugar, oils, starch, etc., etc. These all might be introduced in a separate chapter on "Special Rules and Official Methods for Testing," and in such a chapter should be included the official "Arsenic Tests," "Time Limit Tests for Heavy Metals," "Tests for Iodine Absorption of Fats and Oils," "Saponification Value of Fats and Oils," and "Acid Number for Resins, all now classed with Test Solutions." (Lyons, Havenhill, Beringer.)

Sterilization.—A chapter on sterilization should be introduced in the Pharmacopœia, briefly setting forth the object to be obtained, and giving *specific* and *practical* directions that will enable the pharmacist to apply the various methods of sterilizing or rendering aseptic, instruments, appliances, and such medications as solutions for opthalmic practice, hypodermatic injection, intravenous injection, applications to wounds, mucous surfaces, or to the skin or scalp. These methods and instructions could be readily classified so as to permit the physician designating by a title the method of sterilization on his prescription, and the pharmacist recognizing the intent. (Beringer.)

New Alcohol Tables Needed.—"We shall need a new alcohol table, modified to conform to that of the Bureau of Standards, unless it shall appear that in some details this admits of modification. There is a wide difference between the Table of the New Codex, which is stated to have the authority of the National Bureau of Weights and Measures, and the table of our Bureau, but I incline to think that the latter is essentially right, and I find that it is in harmony with other new tables—all being based on the data of Mendeleef.

"One thing appears certain, viz., that mixtures of alcohol and water do not immediately assume their maximum condensation. A mixture freshly made, containing 20 per cent. of alcohol will show by Gilpin's table, which was based on mixtures that had been kept a month, a higher percentage of alcohol by 0.2 to 0.4, or even 0.5, than its known content. After being kept only a few days such mixture will show the correct percentage. This probably accounts for some of the discrepancies in alcohol tables." (Lyons.)

ADDITIONS AND ELIMINATIONS.

The Committee on Revision was instructed to admit articles and products into the Pharmacopœia in accordance with the rules and general principles adopted by the convention for their guidance.

General Processes.—In addition, it was recommended that general formulas be introduced. This recommendation was not generally followed, but in at least two classes, namely, medicated waters and suppositories, was this plan presented. It is believed that it might be extended to a number of other classes. Commendable is the method used in the French Codex, which frequently directs that a process used in a previously named formula be followed. Both of these plans are available and would save much useless repetition in the text. In this connection, it is to be observed that the other principal pharmacopœias have descriptive articles and general formulas introduced more or less extensively.

Diacritic Signs.—The diacritic signs that appeared in the Latin titles and scientific names in the index in former editions are missed and should be added.

Enumeration of Use in Official Formulas.—The omission of the enumeration of all preparations in which the drugs and chemicals enter, has been much criticized, and it is believed that this feature should be restored.

Tables and Lists.—Tables should be introduced with the co-operation of the government departments and their bureaus:

Physical constants: Metrology, temperature, etc., with the Bureau of Standards.

Alcohol tables with the Internal Revenue Bureau.

Alcoholic strengths of preparations with the Bureau of Chemistry and Drug Laboratory.

There should also be a list of potent substances for reference as to poisons, and legislation, and a classification of articles and preparations for their preservation.

Additions.—Opo-therapeutic agents together with their preparation for injection; also sero-therapeutic agents should be fully described as in the French Ph., which recognizes also:

Sera: Antipest, antistreptococci, and antitetanic and anti-venomous, besides antidiphtheritic and vaccines. Tuberculin is found also in the German and Swiss Ph's. The following articles are worthy of consideration for admission to the U. S. P.:

Magma bismuthi.

Caffeinæ: Sodio-benzoas et Sodio-salicylas.

Elixir glycyrrhizæ, et aromaticum.

Elixir taraxaci comp.

Essentia pepsini.

Flexts: Coffeæ tost, juglandis, kavæ, sterculiæ, zeæ.

Magma magnesiæ.

Ung. resorcin. comp., ung. sulphuris comp., suppositoria boroglycerini.

Acetyl salicylic acid.

Cotarnine hydrochloride et phthalate (stypticin & styptol).

Suprarenaline.

Tannin—proteid derivatives.

Silver—proteid derivatives.

Theobromine sodium salicylate.
Potassium guaiacol sulphonate (Thiocol).
Glycerophosphates: Ca. K. Na. Fe. Mn., and alkaloidal.
Morphine: Diacetyl and ethyl-hydrochloride.
Phenolpthalein.

Dismissals:

Aethylis carbamas.
Iodolum.
Chirata and flext.
Cypripedium and flext.
Phytolacca and flext., pyrethum Tr.
Ol. erigerontis. Santonica.

(Hallberg, Eberle and Mittelbach).

The sub-committee on additions and dismissals will submit a more extended list of recommendations in the next annual report.

TESTS FOR ORGANIC AND INORGANIC CHEMICALS.

There is a lack of harmony in the official directions for testing many chemicals for impurities, and in determining the per cent. of pure salt present. This could be largely obviated if the commonly applied tests and methods of assay were classified and official directions for applying these be given and then a uniform proportion of the article to be tested prescribed. (Beringer.)

"Since the Pharmacopœia has become legalized, it should be more specific. Wherever there is a limit test the amount of impurity allowed should be stated. Many of the present tests are hard to determine with any degree of uniformity." (Havenhill).

"In all cases where there is a purity rubric, quantitative tests should be appended." (Havenhill).

"Where substances are of different strengths, it is desirable to have them brought to the same strength before the qualitative tests are applied, as, for example, in the case of acids, alcohol, etc." (Havenhill).

Tests for Pharmacists.—It should ever be borne in mind, that the Pharmacopœia is the druggists' law book and guide, and that he has a right to expect that the tests laid down for identity and purity of the products shall be such as are simple, and can be readily applied with the apparatus and skill at the command of the average pharmacist. The introduction of weights in vacuo, determinations of specific gravity in vacuo, and the directions "to heat in a vacuum," as is done, for example, under antimony and potassium tartrate, smacks of the ridiculously impractical, ultra-scientific and pedantic, and is entirely out of place in a work of this character.

The language used should be clear and the directions should be accompanied by at least sufficient explanations to make each step clear without presuming that every druggist has already had the advantage of a training in analytical chemistry that will enable him to understand the omissions and defects of the instructions officially laid down. The chapter on titration with the tenth-normal silver nitrate volumetric solution illustrates this point. The following amendments and corrections therein are submitted, paragraph "a," page 560, should have as title "The titration of soluble chlorides and bromides in neutral, or only slightly alkaline solutions." Paragraph "b" directs "An accurately measured excess." This should read "An accurately measured quantity in excess of the required amount." Paragraph "c" fails to direct that potassium iodide is the indicator for this method, or to explain why the tenth-normal silver nitrate "is fifth normal instead of tenth-normal solution." (Beringer).

ALUMEN EXSICCATUM.—"Should contain not less than 99 per cent. of pure anhydrous aluminum and potassium sulphate." If this means that the product after *complete exsic-*

cation should contain not more than 1 per cent. of impurity, there is no criticism to make and this is in accordance with a possible interpretation of the paragraph on page xxviii regarding the purity standard requirements. The paragraph is obscure and I cannot read it as having any bearing on the present case."

"If *pure* potassium alum is heated until its weight is reduced to 55 per cent. of the original, the product will retain almost exactly, 1 per cent. of water of crystallization, and so will conform to the U. S. P. requirements. If, however, this alum contained as is permitted, 0.5 per cent. of impurity, the dried salt will contain nearly 1 per cent. of the same impurity if non-volatile, besides some water of crystallization and so will not meet the requirements of 99 per cent. of anhydrous alum." (Lyons).

TEST FOR NITRATE IN BISMUTH SUBCARBONATE.—"Better success has been obtained with the indigo test than with the present official test for the presence of bismuth subnitrate in bismuth subcarbonate." (Havenhill)

ESTIMATE OF ARSENIC TRIOXIDE.—"Mr. Chas. E. Caspari has pointed out that the method of quantitative estimation of arsenic trioxide is unsatisfactory. The method recommended by him (A. Ph. A. Proceedings, 1905) seems to be quite satisfactory." (Havenhill.)

REDUCED IRON.—"A careful working over of both the qualitative and quantitative tests for reduced iron is needed and might result in improvements." (Havenhill.)

FERRI CHLORIDUM, U. S. P.—"Should contain not less than 22 per cent. of metallic iron," and liquor ferri chloridi "should contain not less than 29 per cent. of the anhydrous salt corresponding to 10 per cent. of metallic iron." But 40 Gm. of ferric chloride contain all the iron there is in 100 Gm. of liquor ferri chloridi, *i. e.*, 10 Gm., which would be 25 per cent. instead of 22 per cent. of 40 Gm.

"In the test for liquor ferri chloridi, 1.11 Gm. require for saturating the iodine set free 20 Cc. $\frac{N}{10}$ sodium thiosulphate V. S., while in the test for ferric chloride 0.555 Gm. of the product equal to 1.3875 Gm. of the *Liquor* require only ('not less than') 22 Cc. of the same V. S. instead of 25 Cc. to correspond with the foregoing requirements.

"The theoretical $FeCl_3 + 6H_2O$ contains only 20.68 + per cent. 'metallic' iron. If this is the product aimed at, the 100 Gm. of liquor ferri chloridi should yield nearly 48.35 Gm. instead of 40 Gm. Should not 40 be changed to 48 with requirement of 20 per cent. or (20.5 per cent.) metallic iron for the product?" (Lyons.)

ASSAY PROCESSES FOR MERCURY PREPARATIONS.—"Very few pharmacists make the official preparations of mercury and assay processes for the galenicals containing metallic mercury are needed." (Havenhill.)

POTASSIUM CARBONATE.—"This is a deliquescent salt which does not appear to have been considered in the prefatory remarks of the U. S. P., since it can contain a very large amount of water of hydration, and still be in a state of sensible dryness. The allowable loss at 130° C. should be limited." (Havenhill.)

MILK SUGAR.—"The tests for the presence of cane sugar in milk sugar are still unsatisfactory. The polariscope appears to afford a satisfactory solution to the problem." (Havenhill.)

SOAP.—"The allowance of 36 per cent. for water seems to be excessive; 25 per cent. seems to be quite liberal. Since this article is to be used in the powdered form, where the moisture rarely exceeds 3 per cent., it would seem desirable to have the tests refer to the dried soap." (Havenhill.)

ASSAY PROCESSES FOR ORGANIC DRUGS.

These processes were introduced in accordance with the instructions of the convention, "to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple (both as to methods and apparatus required), and lead to fairly uniform results in different hands."

As regards the products of such assays, "tests of identity and purity should be added wherever feasible."

It is believed that the official processes fairly reflected the status of our knowledge at the time of the revision. They mark a very decided advance over the assays of previous revisions and compare very favorably with those of other Pharmacopœias, even of later date. But, it must be admitted that this branch of pharmaceutic chemistry is in its evolutionary period, and that much still remains to be accomplished in the way of simplifying and improving official assay processes.

The results of the co-operative work of twenty different analysts assaying samples of the same lot of several alkaloidal drugs as published in the proceedings of the twenty-fifth annual convention of the "Association of Official Agricultural Chemists," pages 129–136, demonstrate that much is still to be desired in the line of obtaining "fairly uniform results in different hands," and that a great deal of experimental work is still necessary before perfection in organic drug assays is assured.

The other part of the instruction to the Committee, namely, addition of tests for identity and purity of the resulting products of such assays, is likewise far from a satisfactory treatment in most of these official assays. (Beringer.)

"Assuming that the alkaloidal assay methods are reasonably exact (which they are not), they give reliable information only when the drug assayed is not adulterated with other alkaloidal drugs. The identity of the crude drug is established by the Pharmacopœia definition and description, but adulteration is most easily practiced in the powdered drugs and in their preparations for which there are no pharmacopœial descriptions. If the quality of these is to be judged at all by the pharmacopœial tests, it must be by the assay. In these cases where the assay is most needed, the official one is practically worthless, since it is not supported by an adequate description of the powdered drug, or by suitable qualitative tests to establish the identity of the substances estimated in the assay process, nor are the individual assay processes that are calculated to enable us to determine the active principle or principles of the particular drug and not include in this determination the active principles of other drugs which may be present accidentally or otherwise, that is, special assay processes rather than general ones." (Havenhill.)

Shall the List of Assayed Drugs be Increased?—"I strongly advise against increasing at present the list of drugs for which alkaloidal standards shall be established by the U. S. Pharmacopœia. Some will probably suggest Gelsemium, others, Veratrum. For neither of these are we as yet in position to fix alkaloidal standards. The amount of total alkaloids is no criterion of the therapeutic virtue of either, so that a standard would mean nothing."

"We have already several assays that are of questionable value, inasmuch as they assume that the proportion of total alkaloids is a measure of the activity of the drug."

"The only drug which might be considered as a subject for standardization (by chemical tests) is podophyllum, and for this an assay process should be supplied." (Lyons.)

Finer Powders and Aliquot Method.—"I believe that finer powders, No. 80, at least would yield better results in the official assay processes. I prefer Keller's general method of assay to the percolation method, and believe that more work should be done before it is discarded for the longer and theoretically more exact percolation." (Havenhill.)

Titration of Alkaloid Residues.—"It would be well to select one indicator for all alkaloidal titrations in official assay processes. Why should iodeosin be retained for nux vomica assays and cochineal directed for the other? The acid V. S. and alkali V. S. should be previously standardized against each other, using the indicator directed in the alkaloidal titration and not use acid and alkaline volumetric solutions, each standardized with different indicators. I would prefer the use $\frac{N}{50}$ V. S. for both acid and alkali." (Beringer.)

"The basis for the titrations should be $\frac{N}{10}$ V. S. Hydrochloric Acid. This should be standardized against pure crystallized morphine using cochineal as indicator, if that indicator is to be used in the assays, and, on the whole, I think cochineal is to be preferred to iodeosin. For alkali, I think, lime water is most suitable.

The detail of the titration is as follows: Dissolve the alkaloidal residue in 2 Cc. of alcohol. Add 2 Cc. (in some cases 3 to 5 Cc., according to probable amount of alkaloidal present, which is to be judged by a preliminary weighing) of $\frac{N}{10}$ acid. Add 20 Cc. distilled water, which should be previously boiled to free from CO_2. Add 5 drops Cochineal T. S. and titrate with the lime water. Make a blank test using the same quantities of $\frac{N}{10}$ acid, alcohol and distilled water to determine the titre of the lime water. To the exactly neutralized acid add again 2 Cc. $\frac{N}{10}$ acid, and repeat the titration and deduce again the titre of the lime water, which should be the same as before. If not, you have still all needed data for calculation. Let 'A' stand for the amount of lime water consumed in the titration of the alkaloid, 'B' that consumed in the control experiment, and 'C' that consumed in neutralizing 2 Cc. of the decinormal acid in the third titration. Then the result of the experiment reduced to decinormal terms will be $(B - A) \div \frac{C}{2}$ = the amount of decinormal acid required to neutralize the alkaloid. The routine consumes very little time, and the calculation is simplicity itself. Should it happen that either the alcohol or distilled water is not strictly neutral, the result will be correct."

"Very weak volumetric solutions of potassium and sodium hydroxide are a delusion and a snare for the tyro in chemistry. The lime water can be depended upon—as long as it is clear—to be caustic and homogeneous. If turbid, it is easily filtered." (Lyons.)

Assay of Aconite.—"Determination of total alkaloids of aconite does not furnish a criterion of the medicinal value of the drug. It is probable that the assay of a fresh drug for total alkaloid does indicate fairly well its value. It is certain that this is not true in case of an old sample, and still less in case of extracts and similar preparations of the drug." (Lyons.)

"The use of the very large factor 0.064 in determining total alkaloid by titration leads to serious error, since the inert, or comparatively inert, alkaloids that accompany aconitine (and in old samples, perhaps wholly replace it), have a very much lower molecular weight. It happens often that titration shows a very much larger amount of alkaloid than weighing does." (Lyons.)

"There should be some very good reasons for using alcohol (70 per cent.) as a primary solvent in case of aconite in place of chloroform, ether or some similar solvent, used in nearly all the pharmacopœial assays of alkaloidal drugs. Personally, I do not believe that such reason exists." (Lyons.)

"The ether used for this final extraction, in my experience fails to extract the whole of the alkaloid. At least, chloroform used afterwards takes out a notable quantity of alkaloid, which when dissolved in acidulated water produces the tingling characteristic of aconitine." (Lyons.)

"The present aconite assay would, in my opinion, be improved by using aconite in No. 80 powder and substituting alcohol for the 7–3 hydroalcoholic menstruum at present used. Though even here I prefer the aliquot (Keller) method." (Havenhill.)

"In the assay of aconite and preparations of same, ether is directed as the solvent, although it is well known that chloroform is the better solvent for the alkaloids of aconite, and the writer suggests that in place of ether, chloroform be substituted, or a mixture of chloroform and ether, as directed in the German Pharmacopœia." (Beringer.)

"If a chemical assay of aconite is retained in the Pharmacopœia, it should by all means be supplemented by Squibb's test. An aqueous solution of aconite 1 : 500 ought to produce a very strong and lasting tingling, when 60 minims of it are held one minute in the anterior part of the mouth—the mouth rinsed well both before and after with clear water. A solution 1 : 700 ought to produce very distinct tingling." (Lyons.)

ASSAY OF BELLADONNA LEAVES.—Corrections—page 67.

"Line 1 of directions for 'an Erlenmeyer flask' read, 'a 100 Cc. Erlenmeyer flask.'"

"Line 5 for 'one hour,' read 'two hours.'" (Lyons.)

"Line 7. Personally, I prefer to receive the percolate in a 100 Cc. measuring flask, making up the measure to 100 Cc. I think in this assay the drug will be sufficiently exhausted by this routine, without requiring that percolation be carried to such complete exhaustion that 2 Cc. of the percolate shall fail to show the presence of alkaloid." (Lyons.)

"Then (line 14) direct that the percolate be transferred to a separator, the flask be rinsed first with 5 Cc. of 5 per cent. sulphuric acid, then with 5 Cc. of water, the rinsings to be also transferred to the separator. (I do not think a larger quantity of water is of any advantage. Perhaps it would be advisable to direct to put into the separator a bit of litmus paper to make sure that the acid is in excess, although there ought *not* to be doubt that such would be the case.)

"Line 17. Instead of 10 Cc. of acid of the same strength, use two successive portions of 10 and 5 Cc. of 1 per cent. acid." (Lyons.)

"Line 20, for 'solutions,' read 'solution,' and in the following line omit the word 'red.'" (Lyons.)

"Line 27. The alternative of iodeosin for cochineal is right enough, but the manipulation is so different when this indicator is used that the directions following are insufficient if the iodeosin is used. In any case, there should be added a certain amount of distilled water before titrating. In line 26 the word 'exactly' should precede '3 Cc.'" (Lyons.)

ASSAY OF FLUIDEXTRACT OF BELLADONNA ROOT.—"Instead of washing the chloroform (line 6–7) only once with acid, and filtering the acid solution, it is much better to wash first with 5 Cc. 5 per cent. acid and 5 Cc. water, then twice with 10 Cc. of 1 per cent. acid, without filtering. On the other hand, it is a good plan *always* to filter the final chloroform (or ether) solution of the alkaloid through a filter previously moistened with the same solvent. If this is not done, the chloroformic solution should be washed with distilled water (at least 5 Cc.) before drawing it off into the beaker. The quantity, of decinormal acid—5 Cc.—is needlessly large, particularly as the same assay process is to be followed with fluidextracts and tinctures of other mydriatic drugs where the total alkaloid is smaller than in fluidextract belladonna root." (Lyons.)

"For the assay of fluidextract of belladonna I find the following (recently published) method convenient and satisfactory:

"Measure into a beaker 165 Cc. of distilled water, add 15 Cc. solution of lead subacetate, mix thoroughly, and then add in a thin stream, with constant stirring 20 Cc. of the fluidextract (measurements all to be exact). Filter through a 20 Cm. filter, collecting as much fluid as will pass. To this add 2 Gm. of air dried sodium phosphate in powder. Shake well, let stand a few minutes and filter through a dry filter of close texture. (Test the filtrate with a little more sodium phosphate, which should produce no precipitate. If it should do so, more sodium phosphate must be added—I myself determine whether or not the lead subacetate is in excess in the first instance by tasting the mixture cautiously, and after adding the sodium phosphate, I taste once more to see whether any sweetness remains). Of the clear filtrate, free from lead, measure into a separator 100 Cc., representing 10 Cc. of the fluidextract. Add 2 Cc. of water of ammonia and shake out with three portions of chloroform, 25, 20 and 20 Cc. Dry, weigh and titrate as usual. The same method serves for all galenical preparations of mydriatic drugs, with suitable modifications, and is a good general method for many drugs. It may indeed be used for the assay of such crude drugs as belladonna leaves, etc." (Lyons).

ASSAY OF EXTRACT OF BELLADONNA LEAVES.—"The directions on page 134, for dis-

solving the extract in a beaker in an immiscible liquid is impractical. This should be changed to read, 'Weigh the extract of belladonna leaves into a small beaker and dissolve in a mixture of alcohol 5 Cc., distilled water 10 Cc. and transfer to a separator. Wash the beaker with a mixture of 2 Cc. alcohol, 4 Cc. distilled water, and add this to the solution in the separator, then add the ammonia water and chloroform.'" (Beringer.)

ASSAY OF CINCHONA.—"The assay method on page 102 is as simple and convenient as any that has been proposed, and for practical purposes as good as any. The following minor criticisms may be made:

Instead of ether 250 Cc. and chloroform 50 Cc. direct to take 300 Cc. of a mixture of ether and chloroform in the proportion of 5 of the former to 1 of the latter by volume. (The mixture must of course be measured only after cooling to air temperature.) In line 9 of the directions "of the supernatant liquid" is tautological. Read "of this." In line 13 for "5 Cc., of normal acid," read 3 Cc., and then direct to repeat *twice* the washing out with the same mixture, and then to make sure by an additional washing out that the alkaloid has all been extracted. (I find that it is best to continue to use acid in the water to the end. Generally the four washings suffice).

In line 4 of the second paragraph, insert in place of the word "then" the words "after the liquids have completely separated." In line 10 of this paragraph I see no object in adding ether and evaporating it off.

The most important criticism has to do with the third paragraph the directions should read, beginning with the second sentence (in line 3).

"Shake the separator well for a few (15) seconds, then cool it to a temperature of 15° C. (59° F.), and keep it as nearly as possible at that temperature ten minutes, shaking it continuously during that period, after the liquids have separated," etc. In line 6, the same changes should be made in the assay process for fluidextract of cinchona, page 174. In this case, however, allow the directions to stand as they read in the first 5 lines, where 66 Cc. is near enough to the correct aliquot for practical purposes.

In the assay for tincture of cinchona, page 462, I should substitute for "bottle" an "Erlenmeyer flask," and for "180" as its capacity "200."

"I do not know why there should not be an assay process given for compound tincture of cinchona." (Lyons).

ASSAY OF COCA.—"There is nothing important to criticise in the assay processes for coca and its fluidextract. Some of the comments made on the assay of belladona apply here as well.

The attempt to standardize coca on liquid preparations of coca are futile, inasmuch as neither will remain "standard" for any length of time. They should not be retained in the Pharmacopœia. (Lyons).

ASSAY OF COLCHICUM.—"The choice of a primary solvent seems irrational. Of what use is the ammonia? Supposing that there is some occult reason for using it, the directions should provide for separation from the mixture of a certain amount of water (holding of course much of the ammonia), and measurement of the solvent should be made only after this separation has taken place, the aqueous portion either being rejected or added afterwards. Of course the aliquot portion taken, as the assay now stands is a little too large.

The wording of the instructions to collect in a measuring cylinder 50 Cc. of the filtrate (line 5) needs revising. The procedure to get rid of fatty substances is one that succeeds fairly well, but at least three portions of water should be used—perhaps 10, 5 and 5 Cc., the filter should have a diameter not over 3 Cm. which should be stated for the benefit of tyros.

The recommendation has been made to use paraffin rather than ether to separate fatty substances, and I am inclined to think this an improvement. The best way of doing

this in detail should be worked out experimentally. The plan is to melt the paraffin, add the water, previously warmed, stir well together during several minutes, then allow to cool, the paraffin retaining the fatty substances, the water taking up the colchicine. The paraffin is to be treated then twice more with small quantities (5 Cc.) of water in the same manner as before.

Petroleum ether is recommended by some in place of ether. I do not find it as convenient in practice as the paraffin.

Repetition in the assay process of this separation of fatty substances after the colchicine has been extracted with water seems to be superfluous. It is true that the separation is not as complete as could be desired, but in the other assay processes (colchicum seed and fluidextract and tincture of the seed) where a much larger portion of fatty matter is present, this step is omitted. What we want to know is how much colchicine is present in a confessedly impure product. Is there no direct way of determining this? One may go back to the oldest method of all—the use of Mayer's reagent, and I believe with satisfactory results. This would simplify matters greatly, since there would be no need of the shaking out with chloroform. Titration with Mayer's reagent will give reasonably accurate results if the excess of Mayer's is titrated with a standard strychnine solution. Even without this refinement, I find that I can get results good for all practical purposes by Jacobson's method of titration.

COLCHICUM CORM.—"I have hit upon a very simple method of assaying colchicum corm which seems to me the best yet found. I treat the powdered drug with warm water containing a sufficient quantity of liq. plumbi subacet. (1 Cc. to each Gm. of drug), macerate 2 hours, percolate with warm water (40° C.) to obtain from each Gm. of drug 20 Cc. (perhaps 15 would be enough), add powdered sodium phosphate in slight excess, to precipitate excess of lead, filter and shake out an aliquot portion with chloroform. The alkaloid thus obtained is exceptionally pure. The whole assay may be completed in 3 hours. Perhaps a longer maceration might be prescribed to make sure of exhausting the drug.

For colchicum seed, the method would require some modification, I doubt whether water would serve as well as a primary solvent in this case.

"For extracts and other galenical preparations of colchicum, I think the lead method which I use for mydriatics is the best. When applied to preparations of the seed it does not work so well because there is so little for the lead to act upon to form a bulky precipitate, and so the filtration is apt to be troublesome. This, I think, can be overcome by adding some extract free from alkaloid. I have not worked out details, but should experiment with fluidextract of dandelion or burdock.

ASSAY OF EXTRACT OF COLCHICUM CORM (page 136):

In line 11, the directions to render alkaline with ammonia are unnecessary. In line 17 we have another example of a repetition of the separation by ether of fatty substances only here we are to mix the ether with water (?) and treat the residue with the "mixture."

"Dr. Gunnar Heikel has lately published (Chem. Zeitung, 1908, No. 95), a new method of determining alkaloids by Mayer's reagent. An excess of the reagent is added, the solution made up to a definite volume, after thorough shaking the solution is filtered and an aliquot part is titrated to determine the excess of Mayer's reagent. This is done by adding 10 Cc. of $\frac{N}{10}$ potassium cyanide V. S., excess of ammonia and then $\frac{N}{20}$ silver nitrate q. s. to produce a permanent clouding of the solution.

"I find it more convenient to use an $\frac{N}{40}$ silver solution and an approximately $\frac{N}{20}$ cyanide solution. The exact value of the cyanide solution is found at the time of each experiment or series of experiments, by adding to exactly 10 Cc. of the cyanide solution a few drops of potassium iodide T. S. 1 Cc. of ammonia (10 per cent.) and titrating with the $\frac{N}{40}$ silver solution, the end reaction marked by appearance of permanent opalescence,

and the exact amount of silver solution consumed is noted. Now, if a second experiment is made in which 8 Cc. of Mayer's reagent is added to the 10 Cc. cyanide solution 1 Cc. ammonia is added as before, and the solution titrated with $\frac{N}{40}$ silver, it will be found that exactly 8 Cc. less of this is consumed than in the first experiment. In other words, the $\frac{N}{40}$ silver solution corresponds exactly with Mayer's reagent, of course, a second experiment is not necessary, except to demonstrate this correspondence.

"Suppose that 9.45 Cc. of the silver solution is required to cause opalescence in 10 Cc. of the cyanide solution. Now, if we have a solution containing an unknown amount of residual Mayer's reagent (not in excess of 9.45 Cc.), we may determine the amount by adding excess of ammonia, 10 Cc. of cyanide solution and just enough of the silver solution to cause opalescence. If 2.73 Cc. are required for this, then the solution contains $9.45 - 2.73 = 6.27$ Cc. of Mayer's reagent.

"To apply this in a colchicum assay, extract the colchicum first with chloroform in the usual way—say from 10 Cc. of fluidextract of colchicum seed. Dissolve the crude alkaloid in 7 Cc. of diluted sulphuric acid (10 per cent.) preferably without the aid of heat. (I do not think there would be harm in using a few drops of alcohol to dissolve any residue which might retain some alkaloid, but until experiment proves that this is safe, I should not recommend it), add 15 Cc. of water, then 10 Cc. of Mayer's reagent, stir well, let stand a few minutes, then filter through a dry filter (repeatedly if necessary to get a perfectly clear solution.) Of the filtrate take 24 Cc. (three-fourths of the whole), add 10 Cc. of the cyanide solution, an excess of ammonia (about 3 Cc. of 10 per cent. ammonia), and then $\frac{N}{40}$ silver nitrate until a permanent cloud appears. Subtract the amount used from that required in a preliminary blank experiment, as already explained, the remainder will express the excess of Mayer's reagent present in the 24 Cc. of filtrate. To get the total residual Mayer's reagent, add to this one-third of itself. Thus, if the value of the cyanide solution—9.45 as above, and 4.85 Cc., have been required in the actual titration, $9.45 - 4.85 = 4.6$ Cc. is the Mayer's reagent in the 24 Cc. of filtrate and the total Mayer's reagent is one-third more than this, viz., $4.6 + 1.53 = 6.13$. Since 10 Cc. of Mayer's reagent was taken in the outset, the amount which has entered into combination with the alkaloid is $10 - 6.1 = 3.87$ Cc. According to Heikel, each Cc. of Mayer's $= 0.0144$ colchicine; hence the 10 Cc. of fluidextract contained $3.87 \times 0.0144 = 0.0557$.

"The strength of the standard solutions can be so adjusted that the final calculation will be simplified, but the principle of the assay has been made clear. It is well worth a thorough trial. I have always stuck to Mayer's reagent in colchicine demonstrations, and I find my old results check up well with those by Dr. Heikel's improved method." (Lyons.)

Assays of Conium and Physostigma.—"Conium might be a long story, but the drug is practically obsolete. If its effects are desired they can best be obtained by the use of a salt of the alkaloid.

"The same may be said of the physostigma. The official extract of this drug is an impossible preparation in my judgment." (Lyons.)

Assay of Guarana and Kola.—"Query. Is the ammonia of any use in the first step of assay on page 231? Very possibly it is, but it may be that distilled water would answer just as well. At any rate it does no harm. In the assay of the fluidextract, page 188, it certainly is superfluous. The acid used in dissolving out caffeine from the residue after evaporation of the chloroform, and the ammonia afterwards added to render the solution alkaline before shaking out with chloroform, also the ether added to the dry residue of caffeine are superfluous. The expression, "alkaloidal principles contained in Guarana," is also a very awkward way of saying "caffeine." The truth is that the assay process given was devised for the assay of cola, which does contain an alkaloid besides caffeine requiring the use of acid and alkali as prescribed. Instead of "shake at intervals

for half an hour and let stand four hours, the directions in assay of guarana should be "shake the flask at frequent intervals during four hours. Of course filtration of the chloroform to obtain an aliquot part must be conducted in such a way as to avoid loss by evaporation. A good plan is to conduct the maceration in a separator (not a "leaky" one), filtration of the chloroform being then unnecessary. If necessary, a pledget of absorbent cotton may be introduced into the tube of the separator to serve as a filter." (Lyons.)

ASSAY OF HYDRASTIS.—"Little need be said of the assays of hydrastis and its preparations. They serve their purpose well enough as they stand, although ether-soluble alkaloid does not necessarily mean hydrastine, and the value of hydrastis does not necessarily depend on its ether-soluble alkaloid. The use of the assay is mainly to guard against the fraudulent substitution for hydrastis of a drug from which the hydrastine has been extracted." (Lyons.)

ASSAY OF IPECAC.—In the assay process, pages 250–251, I should recommend the following changes: Instead of a mixture of 115 Cc. ether and 35 Cc. chloroform as primary solvent, I should direct 150 Cc. of mixture of ether and chloroform 3:1 by volume, measured of course after cooling. (Reasons: 115 and 35 are not convenient quantities to measure accurately; the volume of the mixture will not be 150 Cc., and there will be inevitably more loss in two measurements than in one. The errors involved all tend to increase the apparent yield of alkaloid—but then complete exhaustion of the drug cannot be assumed, so that these may be regarded as compensatory errors.)

Not because I do not believe that the principle of aliquot parts is not "good enough" for such approximate assays as those of the Pharmacopœia, but in deference to the prevalent prejudice against them, I should, however, use in the outset 10 Gm. of drug and 50 Cc. of the ether-chloroform, afterwards completing the exhaustion of the drug as in the assay of belladonna. In shaking out, I should use first 10 Cc. of 5 per cent. (or normal) sulphuric acid, then three portions 10 Cc. each of a 1 per cent. acid. Each portion of acid to be washed by passing through (with due shaking, etc.) a separator containing 10 Cc. of ether-chloroform 3:1 (volume), and then mixed in a third separator. This will insure freedom of the alkaloid at least from fatty and waxy impurities. In a similar manner I should direct to wash with water (10 Cc.) containing a little ammonia, each successive portion of the final ether solution of the alkaloid. Then I should weigh the alkaloidal residue instead of titrating it. I believe that this is more rational than to assume a titration equivalent which may involve an error larger than that due to impurity of the alkaloid obtained." (Lyons.)

ASSAY OF FLUIDEXTRACT OF IPECAC.—"In the U. S. P. assay, the whole of the alkaloid is not removed by the amount of ether taken. The following alternative method may possibly be better.

"Put into a 200-Cc. flask 10 Cc. of the fluidextract, add 120 Cc. of ether-chloroform (cooled mixture, 3:1 vol.), then 3 Cc. of ammonia water, and shake well for two minutes. Of course some alcohol will pass into the ether-chloroform, so that it will be fair to put the volume of the solution containing the alkaloid at 125 Cc. 50 Cc. would, therefore, equal 4 Cc. of the fluidextract. It is doubtful whether the alkaloid remaining on evaporating this solution would be pure enough to titrate alkalimetrically, but it could certainly be titrated with Mayer's reagent, either directly, with fairly accurate results, or by the method of Heikel.

"If the fluidextract is mixed with the ether-chloroform, etc., in a graduated cylinder, the exact volume of ethereal solution can be read off, and results calculated thereon theoretically—a preferable plan, yet leaving room for question whether the whole of the alkaloid had passed into the ethereal solvent. I believe that the margin of errors in the plan suggested above would not be greater, at any rate than in the present U. S. P. plan.

"Dr. Heikel recommended for determining the alkaloid in fluidextract of ipecac a

procedure similar to what he adopts with colchicum. The following is this plan: Introduce into a 100-Cc. measuring flask 10 Cc. of the fluidextract, add 5 Cc. solution lead subacetate (or q. s. to be in decided excess) and make up to 100 Cc. Shake the mixture and filter; transfer 50 Cc. of the filtrate to a second 100 Cc. measuring flask, add 0.5 Gm. effloresced sodium sulphate and 10 Cc. of 5 per cent. sulphuric acid, then, without filtering, 20 Cc. Mayer's reagent, and make up to 100 Cc. Shake the mixture and filter. To 80 Cc. of the filtrate, representing 4 Cc. of fluidextract, add solution of potassium cyanide, excess of ammonia, and finally $\frac{N}{20}$ silver nitrate, to determine the excess of Mayer's reagent present. Each Cc. of the Mayer's reagent consumed in the titration corresponds with 0.0895 Gm. ipecac alkaloid.

"I have not reviewed this method, but it looks plausible." (Lyons.)

Assay of Nux Vomica.—"In the assay, page 299, the mixture of ether, chloroform, alcohol and ammonia water will not blend completely. A portion of the water will be absorbed by the drug, so that the aliquot taken is not exact. It may be said that the error involved goes to compensate the error from incomplete exhaustion of the drug, but the principle of compensatory errors is not one that should figure prominently in assay processes. I think it better in this case to use 200 Cc. of ether-chloroform (4 : 1) as in other assays of the Keller type, adding the ammonia in the usual way with the expectation that it will not materially alter the volume of the ether-chloroform. For the purposes of such an assay, I should be content to use the principle of the aliquot part instead of percolating to exhaustion as in the belladonna assay.

"The twelve hours' standing is of less use than would be an additional hour of occasional shaking. Perhaps four hours of occasional shaking would not be too much to ask for.

"Perhaps where alcohol enters into the primary solvent, 15 Cc. of $\frac{N}{10}$ acid is not too much for the first shaking out; for the subsequent ones 1 Cc. with at least 5 Cc. of water should be used.

"In washing out the alkaloid from the aqueous solution it is better to use first a mixture of chloroform 20 Cc., ether 10 Cc., then chloroform alone.

"To dissolve the residue of alkaloid, it is better to use 9 Cc. of 5 per cent. acid—making up the volume to 15 Cc. with water afterwards. The 5 per cent. acid (or 'normal' acid, which is of about that strength), is used in many assays, and it is not desirable to have to keep acid of different strength for particular assays.

"In destroying brucine in the assay process for nux vomica, it is agreed that presence of nitrous acid as well as nitric acid is essential. Some recommend to add a small quantity of sodium nitrite. The following expedient seems to succeed perfectly, and is very easily carried out: Use nitric acid of U. S. P. strength, instead of one of sp. gr. 1.42, as directed. To 1.5 Cc. of this add a little sugar (say 0.01 Gm.) and warm in a test-tube until brown fumes are given off, then add 1.5 Cc. of water and pour the mixture into the solution of nux-alkaloids. In this way complete destruction of brucine is insured, apparently without notable loss of strychnine." (Lyons.)

"To determine whether or not the sodium hydroxide solution is in excess by simply noting whether or not the solution remains turbid is not well suited for the guidance of the average man, who would be better satisfied if he used litmus paper for the purpose.

"In the final extraction of the alkaloid use first as above, ether-chloroform (1 : 2 vol.) for the first washing. Watch the evaporation of the strychnine solution, and when the volume is reduced to about 2 Cc. add 5 Cc. of alcohol to diminish risk of loss by decrepitation.

"The assay of a fluidextract or tincture will be conducted in precisely the same way as that of the drug with the exception of the first step. In case of a fluidextract, I myself simply add to the 10 Cc. of fluidextract in a separator, 25 Cc. of chloroform, about 2 Cc. of ammonia water and 5 Cc. of water, shake and separate as usual, then wash out

with about 15 and 15 Cc. more of chloroform. I extract the alkaloid from the mixed chloroform solutions with acid in the usual way and then once more shake out with ether-chloroform (1 : 2) 25 Cc. and chloroform 15 and 15. I always weigh the crude alkaloid so obtained before dissolving to separate the brucine, and expect to get about 40 per cent. as much strychnine as crude alkaloid.

"In case of extract of nux vomica, I generally dissolve first in diluted alcohol, and treat the solution just as I do the fluidextract above." (Lyons.)

ASSAY OF OPIUM.—"Without going into the question of a lime assay, I recommend that an important modification be made in the U. S. P. assay process, making it practically Squibb's method. After the aqueous solution is evaporated nearly to dryness (no need of bringing it to an exact weight), redissolve crusts, etc., and make up to a volume of 25 Cc., add gradually with stirring, alcohol 80 Cc., let the mixture stand a few minutes, then filter through a 9 Cm. filter, folded plain, and when the fluid has all passed, wash the residue with a mixture of alcohol and water (4 : 1, vol.) until free from morphine (the simplest test for this is to evaporate in a porcelain dish 5 drops of the filtrate to dryness; cool the dish and add a drop of strong sulphuric acid, containing in each 2 Cc., a drop of solution of formaldehyde. Presence of morphine is revealed by a purple red color).

"Concentrate the opium solution once more on a water-bath, and make up exactly as described in the text, to 20 Gm., and follow the directions also for the precipitation of the morphine. I think it unnecessary to pass the ether through the filter. I would decant it carefully, as completely as possible into a small beaker, and then reject it carefully, retaining any of the aqueous fluid which may have gone over (or any crystals that may be carried over with the ether—but that is not at all likely to happen). Add to the flask 10 Cc. of fresh ether, rotate it and decant again into the beaker, rejecting the ether as before. Repeat this three times more, then filter the aqueous fluid in the manner directed, through a pair of counterpoised filters. Wash the crystals simply with morphinated water as long as this takes up color. When the filters cease dropping remove them from the funnel and carefully press them with contained crystals between folds of filter-paper as long as these are wetted. Then dry at a temperature not exceeding 60° C. to constant weight, and weigh, using the outer filter as counterpoise.

"The morphine should be tested for solubility in lime water. Should there be any considerable residue, this should be brought into the same pair of filters, as in the official assay, but I question whether this would be necessary. A better plan would be to dissolve the crystals in decinormal acid and determine morphine by titration of the residual acid. If this plan is followed, it may be well to give a longer time for the complete crystallization of the morphine, or to direct a much longer shaking than that prescribed.

"An alternative method is to add to the original aqueous solution before evaporation, 0.25 Gm. ammonium oxalate, reducing to a small bulk, filtering, washing the filter thoroughly with distilled water, then concentrating and going on as in the official process. In my experience, this gives a morphine which is after all not completely soluble in lime water." (Lyons.)

ASSAY OF PILOCARPUS.—"I have never tried the trick of moistening 10 Gm. of a powder with (a mixture of) 2 Cc. of ammonia water and 3 Cc. of chloroform. It does not look reasonable. I *did* propose to mix the ammonia with *alcohol* to moisten the powder, to facilitate packing, and have made a good many assays in this way, percolating with an appropriate solvent, generally ether-chloroform. It is not easy to pack the percolator firmly enough to render the percolation as slow as is desirable, and so I first pack the neck of the percolator very firmly with absorbent cotton, or some equivalent device for retarding the flow. The drug should be allowed to macerate at least 10 minutes with the ammonia, etc., before percolating.

If chloroform is the menstruum, it is probably advisable to begin with a mixture of chloroform with ether or with alcohol. It is doubtful whether there would be any advantage in the use of more ammonia than that used in the first maceration. Certainly the proposal to use chloroform "containing about 2 per cent. of ammonia water," sounds strangely.

"After all is it necessary to use pure chloroform in this assay? I have been in the habit of using a chloroform-ether mixture myself and believe that this will exhaust the drug.

"The percolate is to be skaken out with 15 Cc. of normal sulphuric acid. Probably this will be enough, for the greater part of the ammonia will no doubt remain in the marc, but since this is uncertain under the circumstances, and the 4 Cc. or more of water of ammonia that have been used will neutralize a good deal more acid than this. I should prefer to direct to first wash the chloroform with 10 Cc. of water and reject this, then wash out with about the usual amount of acid, viz., 5 Cc. (or q. s.) for first washing, and 2 Cc. for each of those following (make up in each case to at least 5 Cc.). I find it best to add at least 1 Cc. of 5 per cent. acid to the last water used in washing out alkaloid, for the reason that the acid solution is much less liable than water alone to go into an emulsion. The 7 Cc. of $\frac{N}{10}$ acid used to dissolve the alkaloid finally for titration is a very liberal amount. If the drug contains 1 per cent. of alkaloid 5 Cc. will be needed. I have not met with any drug containing more than that, but it may be as well to provide for the possibility.

"Turning now to pages 199–200, the directions are clear up to line 4, page 200—although I do not like the idea of 'mixing' ammonia water with chloroform. I prefer to rinse the dish first well with the ammonia water, then with the chloroform, used in several successive portions. The next step is a poser. I *suppose* one is to transfer the liquid contents of the flask to a separator, then when the chloroform has separated, draw this off into a second separator—wash the sand in the flask with several successive portions—say 5 Cc.—of chloroform, passing this through the first separator into the second, which will finally contain the whole of the chloroform. If necessary, the chloroform may be filtered before transferring to separator No. 2. From this point the assay should be precisely the same as that of the drug. There is certainly no need of using the 8 Cc. instead of 7 of $\frac{N}{10}$ acid for dissolving the alkaloid at last." (Lyons.)

ASSAY OF THYROIDS.—"Dr. Seidell and I have been working for some time on the thyroid. We are convinced that the value of the thyroid depends upon the content of properly combined iodine. We are working out the details of simple qualitative and quantitative tests for iodine in the thyroid which we think might go directly into the Pharmacopœia." (Hunt.)

ORGANIC DRUGS.

Microscopical Examination of Powdered Drugs.—"The greatly increased knowledge of the histology of organic drugs is reflected in the marked improvement made in the text books and works on pharmacognosy that have appeared during the last decade, and these foreshadow the need for pharmacopœial advance in this direction. It becomes a question for consideration: How far can the next revision safely go in describing the microscopical characteristics, and the appearance of the structural elements in the powdered drugs when examined microscopically?

"In the last revision, the microscopic examination of drug powders was given scant consideration, and only in a cursory way in a few drugs. As examples, in anise where the character and length of the hairs are given, and in stramonium where in the powder the hairs and rosettes of calcium oxalate crystals are mentioned, and in gentian where it is stated 'the powder is free from starch grains and sclerenchymatic tissues.' In other drugs where the microscopic characters are equally important no mention has been

made. Terse and accurate statements should be introduced wherever possible and of practical value in identifying the drug or detecting adulterations. If this is done, then there should also be included in the above proposed chapter on 'special rules and official methods for testing,' methods of preparing sections and powders, stains and micro-chemical reagents for such purposes." (Beringer.)

Definitions and Descriptions.—"The writer recently suggested an innovation in the official definition of drugs, namely, that with each definition there be included a concise statement as to source and habitat, and gave a few illustrations. Having since examined the Pharmacopœia Austriaca VIII, 1906, he noted that this idea prevails therein. The following illustrations, exemplifying the method used therein and proposed for the U. S. P.—'Polygala Senega L., planta perennis Americæ borealis.' 'Lobelia inflata L. planta annua in America boreali spontanea et culta.' 'Cinnamomum ceylanicum Breyne, arbusculus præsertim cultus in insulis Ceylon et Iava.' 'Ferulæ species, imprimis Ferula Scorodosma Bentham et Hooker et Ferula Narthex Boissier, Persiam et regiones adiacentes Asiæ inhabitantes. Succus gummi resinosus e radice vulnerata resecto caule effluxus et aëre induratus.'" (Beringer).

ACACIA.—"Is officially described as 'a gummy exudation.' This would be more correct if changed to 'The air dried' gummy exudation from the trunk and branches." (Beringer).

ALOE.—"The official title and definition attempts to include under this one name at *least*, three commercial aloes, the Barbadoes, Curacao and Socotrine. The official tests, however, require an aloes that 'give a reddish color with nitric acid,' and this would exclude all but the Barbadoes and Curacao, for which varieties the nitric acid coloration is a distinct test and distinguishes these from other aloes that do not contain iso-barbaloin. As Barbadoes aloes has not been a commercial article for a number of years, only the latter would, strictly speaking, be official aloes. This is an example of where the U. S. P. attempts too much under one description. It is recommended that Barbadoes aloes and its source, aloe vera, be eliminated from the Pharmacopœia, and that in the revision each commercial variety recognized be treated under a separate sub-heading, with appropriate description and tests. Also that cape aloes from Aloe ferox, Miller, and other African species of aloes, which is now excluded, although the official aloes of most continental European countries, and an ingredient in many foreign formulas, be recognized. Also that percentage of ash allowable be given in each description. Also, that in the official formulas, in each case, the variety of aloes to be used be specified." (Beringer).

"With the proper limitations to aloes and the modern improved methods in its preparation, a good quality is always obtainable, and there is no longer any need for 'purified aloes,' and this title and formula can be dispensed with." (Beringer).

APOCYNUM.—"The definition of this drug certainly needs revision, and the descriptions would be improved by addition of the histologic characters of the drug and common adulterant." (Beringer).

BERBERIS.—"Here is another indefinite definition. Which are the 'other species of berberis' permissible?" (Beringer).

CALAMUS.—"Despite the fact that only the 'unpeeled,' dried rhizome is official, and this alone should be used in preparation, it is the 'peeled' form only that is salable over the counter and should not both be recognized for their special uses?" (Beringer).

CANNABIS INDICA.—"Is it wise to restrict this to plants 'grown in the East Indies' and exclude all other countries where indigenous (Persia, for example), or where cultivated?" (Beringer).

CANTHARIS.—"The official description is in error in the statement that the powder 'contains few or no hairs.' The hairs on this beetle are characteristic and evident and a distinct feature in the powder. The description is defective as giving no criterion of strength or value of the drug. "In the absence of a satisfactory assay process, a simple

yet valuable indication of the activity of the drug is the following test: 1 Gm. of the powdered cantharides is macerated for three hours with 5 Cc. chloroform and one drop of glacial acetic acid. To the filtered liquid is added two drops expressed oil of almond then evaporated on a watch crystal. The residue painted on a space of 1 inch diameter or less on the clean surface of the forearm should produce a distinct blister in six to eight hours. In addition to this simple and practical test, a process of assay should be given." (Beringer).

CARBO LIGNI.—"The English should be given as 'wood' charcoal, to be a proper translation of the Latin and to distinguish positively from the animal charcoal." (Mittelbach).

CERA FLAVA.—"The definition, 'A solid substance prepared from the honey comb of the bee, Apis mellifica Linne, is faulty in several ways. A more correct definition would be 'a natural concrete secretion forming the wall of the honey comb of the hive bee,' Apis mellifica, Linne, (Order hymenoptera), purified after removing the honey, by melting with water, separating and straining." (Beringer.)

CINNAMOMUM.—"The Ceylon should be dismissed and the Saigon directed for all official preparations. The botanical origin of this latter drug should be determined." (Mittlebach).

It is to be noted that the Chinese cinnamon from Cinnamomum Cassia is not recognized by the U. S. P., although still an important commercial variety.

ELATERIUM.—"More frequently nsed with us than is elaterin, despite the pharmacopœial rejection of the former." (Beringer).

ERIODICTYON.—"Always called for as 'yerba santa' by our physicians." (Beringer).

Fel Bovis Purificatum.—"Purified oxgall as usually preferred and used is in the form of a greenish yellow powder, and this should be recognized instead of the 'soft solid' or 'pilular consistence' directed.

Gambir.—"This change has not met with favor. The peculiar earthy and bitter taste of gambir is objectionable, and our physicians continue to specify 'catechu' and 'tinct. catechu comp.' A return to catechu and the elision of gambir will be welcomed." (Beringer).

Grindelia.—"The official description takes no notice of the stems and branches, which, from the character of the plant, form a large portion of the 'flowering top,' and the commercial drug." (Beringer).

Oleum Hedeomæ.—"Only the American pennyroyal oil is official. There is still on the market a large amount of the foreign oil distilled from mentha pulegium. As the chief constituent in both is identical, and if actions are identical, should not both be officially recognized?" (Beringer).

MEL.—"A drop of the sediment at the bottom of the honey examined by the microscope will show numerous pollen grains, plant hairs and bee hairs and elements indicating the source of natural honey." (Beringer).

Oleum Betulæ.—"As *true* oil of gaultheria is exceedingly scarce and rarely seen in the stores, the Pharmacopœia should direct the use of oil of betula in all official preparations where oil of gaultheria is now given."

Oleum Chenopodii.—"All physical and chemical tests, but color, odor and taste have been stricken out. As this is an American product, no difficulty should exist that would prevent the preparation of authentic samples and the establishing of correct description and tests." (Beringer).

OIL OF EUCALYPTUS.—"The assay for cineol has been criticized."

"We note that Parry recommends that oils of low test should be first fractioned to get good results, and that in oils above 30 per cent. strength there may be an error of 3 per cent. We also note that he adds the acid directly to the oil. If the greatest of care is not taken, some of the uncombined oil enters the magma and causes an error. The U.

S. P. by dissolving the oil in petroleum benzin seeks to prevent this error. The solvent sub-divides the oil and ensures its complete contact with the acid. The statement that a red color shows addition of excess of acid, does not appear to have any value. The color may be yellowish or pinkish from the start, and not grow much in intensity with oils answering other U. S. P. requirements.

"After washing the precipitate with petroleum benzin and drying by pressure, all petroleum benzin should be allowed to evaporate, or it may be read as cineol when the precipitate is decomposed.

"A high gravity may be an indication of a good percentage of cineol, and as the cineol is optically inactive its presence in large proportion must affect the optical activity by varying the proportion of terpene present. Gildermeister and Hoffmann state that pinene and other terpenes are present with lævogyrate ester, but give the rotation at 1° to 15°. It is stated that phellandrene is both dextrogyrate and lævogyrate, so that its presence is not indicated by the rotation. As it is known that pinene of American oil of turpentine may be either right or left rotary, it is possible that the pinene of eucalyptus oil may vary in the same way. The B. P. seems to take this view in passing 10° to −10° oils. It has been stated that dealers mix right and left rotary oils to produce a product to meet the U. S. P. requirements in this particular.

"Examination of eight samples by U. S. P. method, gave absence of phellandrene in excess, from 60 to 75 per cent. cineol, rotation —1.9° to 1°, all other tests were satisfactory. Two lots from different sources had 1.9° rotation and each was 'guaranteed to be pure.'" (Patch).

Scammonium and Resina Scammonii.—"These two drugs illustrate the changes of commerce that are continuously taking place, and that require the consideration of the Committee on Revision so that the official requirements may be in harmony with existing trade conditions and be readily complied with. They also serve as an argument in favor of the contention that there should be associated with the work of this committee one or more persons familiar with the trade conditions and the drug markets of the world.

"The U. S. P. in common with a number of other pharmacopœias has persisted in directing that the resin of scammony be prepared from scammony, the latter being defined as the 'gum resin obtained by incising the living root of Convolvulus Scammonia L.' and is required to contain not less than 75 per cent. of ether-soluble resin. The British Pharmacopœia has also an official scammony root and directs that the resin of scammony be extracted therefrom.

"The British Pharmaceutical Codex, however, states that 'most of the scammony resin of commerce is obtained from the root of Ipomea Orizabensis Ledanois. This Orizaba jalap has become a regular article of commerce and is now listed as 'Mexican scammony.' The substitution of its resin for that of scammony appears to have become general, as a large quantity of this root is said to be consumed in Germany, and I am convinced that it has become largely the source of the scammony resin sold in this country.

"That the gum resin was carelessly collected and grossly adulterated with mineral and vegetable admixtures is well known, and this probably accounts for its disappearance as an article of commerce.

"Desiring to obtain authentic samples of scammony for some investigations of the resin and the trade conditions existing, a number of drug importers of New York and Philadelphia were applied to but no one could supply it. The following two quotations are samples of the replies received: 'With relation to virgin scammony, would say that we have no stock and do not know of any obtainable in this market, as the importation of same has practically been discontinued.' 'As to the so called virgin or crude scammony resin, we would state that this article is absolutely unobtainable of a grade which comes up to the requirements of the U. S. P.'

"The Orizaba root as 'Mexican scammony root' and the root of Convolvulus Scammonia as 'Turkish scammony root' are regular articles of import.

"Two samples of each were procured and extracted with alcohol and the resin precipitated. The Turkish yielded 7.68 per cent. and 10 per cent., and the 'Mexican' 12 per cent. and 15.1 per cent. and this increased yield is the incentive for its use. The resins from both of these sources developed the same sweet odor resembling that of preserved tamarinds and closely resemble each other. The ipomea resin is somewhat darker in color, but this coloring could be readily removed by treating the alcoholic extract with charcoal before concentrating and precipitating when the simulation would be still closer.

"The investigations of Spirgatis showed that the ether-soluble portion of the resin from the Orizaba root, the 'jalapin,' was identical with 'scammonin,' the ether-soluble portion of scammony resin, and this has been made the basis for the statements in text books that the *two resins* are identical, and upon this assumption the trade has acted and felt warranted in marketing as scammony resin the product of either or a mixture of both.

"For the purpose of this report, the writer will state that from his experiments he is convinced that there are some differences in the resins and in their content of ether soluble resin.

"It is apparent from the above presentation of the true trade conditions that some change will be necessary in the official requirements. The Pharmacopœia should either follow the example of the British Pharmacopœia, or the writer favors a somewhat more radical change, namely, the omission of both scammony and resin of scammony, and the recognition of 'scammonin' only, and its directions in the few official formulas in which scammony resin is used. As the ether-soluble portion of true resin of scammony 'scammonin' represents from 95 to 99 per cent. this is not as radical a change as it appears, and is in the proper direction." (Beringer).

SENNA.—"India senna should be designated as Tinnevelley senna, the commercial name used by jobbers, dealers and customers alike." (Mittelbach).

Veratrum.—"Botanical authorities are agreed that the difference between American hellebore and the European or white hellebore, is more than varietal, and sufficient to hold both as distinct species. While some of the alkaloidal constituents may be present in both drugs, chemists are *not* agreed that these are present in the same proportions, nor that the other constituents are identical. Pharmacologists and clinicians distinguish a difference in action (see U. S. Dispensatory, 19th Edition, 1330).

"If the same arguments that dictated the grouping of these two distinct drugs under one official title are to be consistently adhered to, then we should have both viburnums under one title, hyoscyamus muticus would be permissible for hyoscyamus niger and scopola and belladonna admixtures accepted." (Beringer.)

OFFICIAL FORMULAS AND PREPARATIONS.

Waters.—"The Latin title 'Aquae' is not the equivalent of 'medicated waters,' and if this English name is to be continued, the Latin title should be changed in the general formula. The term 'medicated waters,' however, is applicable to an entirely different class of preparations from those intended by the Pharmacopœia. What is really intended is a class of waters aromatized with volatile oils, and the title 'Aquae Aromaticae,' with the English 'Aromatic Waters,' would probably be more appropriate." (Beringer.)

AQUA AMMONIÆ AND AQUA AMMONIÆ FORTIOR.—"Should be transferred to Liquors as chemical solutions, more appropriately classed there.

AQUA HYDROGENII DIOXIDI.—"With the English name, 'Solution Hydrogen Dioxide,' is certainly out of place. It must likewise be transferred to the 'Liquors.' It is difficult

to understand an official classification that excludes 'Lime Water' and 'Lead Water' yet includes these in the waters.

AQUA HAMAMELIDIS.—"Is another questionable title for a preparation containing 15 per cent. by volume of official alcohol. If it is to be continued as Hamamelis Water, then the title should be changed to Aqua Hamamelidis Spirituosa, to indicate that it is distinctly different from the other official waters. Its common use, however, would suggest that it should be classed as a lotion and the title be 'Lotio Hamamelidis.'

AQUA AURANTII FLORUM.—"There should be only *one* orange flower water, namely, the saturated and the present title for the diluted should be applied to this so as to have only one title." (Beringer.)

CATAPLASMI KAOLINI.—"Is not an entirely satisfactory formula. The product is too firm and difficult to keep uniformly plastic. The British Pharmaceutical Codex has modified it by adding 5 per cent. more glycerin and reducing the kaolin by the same amount, which is some improvement." (Beringer.)

"The trouble arising is to keep it free from moisture. Even if the directions are carried out accurately and the kaolin thoroughly dried, the product will reabsorb enough moisture from the air to make it objectionable. It will become too moist, and I have never been able to make it satisfactory to myself." (Mittelbach.)

Solids for External Use.—"The samples of plasters, cerates, ointments, etc., were made with ordinary care, such as the average pharmacist uses in preparing and dispensing the same. There is no doubt but that a few pharmacists in this country can, and do, dispense superior looking preparations. These are the exception, however, and their work is not a criterion of the perfection or usefulness of the official formulas. What the Committee on Revision desires to know is this, are the present official formulas practical and simple enough for the average pharmacist? I believe they are nearly all practical and none too complicated for the rank and file of the drug business.

"The samples have been kept in the cellar since they all were made (last fall and winter). Upon examining each of them I find nearly all in good condition, something not expected of a number of them, especially ointments. The only plaster I find somewhat deteriorated is that of belladonna. The belladonna ointment also shows signs of spoiling. The ointments of nutgall and tannin have darkened, probably due to the metallic cover of the containers. The ointment of potassium iodide became granular. This I looked for, and this ointment anyway always should be made up as called for. The ointment of vertrine seems to have darkened. Can't account for it. The ointment of red oxide of mercury seems also to be undergoing change."

The following notes and comments were indited when the samples shown were prepared:

ADEPS.—"Should be kept in well-closed *tin* vessels. The ointment jar that is generally used by the pharmacist is not a good container. Lard manufacturers and butchers (practical men at the business), never place lard on the market in earthenware or glass containers. They found by practical experience that tin vessels are the best."

Adeps Benzoinatus.—"Am inclined to believe that the old way of suspending the benzoin enclosed in a little cloth sack in the melted lard is the better way of benzoinating it. It is a cleaner process, too."

Adeps Lanae.—"Its property of being miscible with a large quantity of water is information enough for the physician without making the hydrous official."

Adeps Lanae Hydrosus.—"If retained, make it a definite mixture containing 30 per cent. of water. To state that it contains *not more than* 30 per cent. leaves an opening to have it vary below that point, and we can expect varying percentages. Dismiss it entirely, and leave it to the practitioner to indicate the percentage of water or watery solution of such drugs as he desires to use with it."

Cera Alba.—"Melting point too high. Whether due to the process of bleaching or from action of the atmosphere, I can't tell.

Ceratum.—"Not satisfactory. That of 1880 and 1890 is better. Yellow wax and lard in the proportion of half and half I believe would make an excellent Ceratum, and might possibly answer for Unguentum too. A fault I find with Ceratum, and one that applies to all Cerates, is that the high congealing point of white wax makes the product lumpy unless the greatest care is taken just as the mixture congeals. Even with constant stirring at this point the product is liable to have small lumps of the white wax throughout the mass; and it is often necessary to rub these out in a mortar. This should not be. Yellow wax will not cause this trouble, and the little color imparted to the product is not objectionable. I don't like the addition of petrolatum to any of the Cerates."

CERATUM PLUMBI SUBACETATIS.—"Is good."

CERATUM RESINÆ.—"A fair product. I like the 1880 better."

CERATUM RESINÆ COMPOSITUM.—"A good preparation."

CHARTA SINAPIS.—"Is easily prepared."

EMPLASTRUM ADHÆSIVUM.—"Very good. When pure rubber is used, straining the product is not necessary."

EMPLASTRUM BELLADONNÆ.—"Excellent."

EMPLASTRUM CAPSICI.—"Excellent."

Emplastrum Hydrargyri.—"Not satisfactory. The directions should be changed so as to use the Hydrous Wool Fat early in the manipulation, to help rub out the mercury more quickly. Under the present directions it is almost impossible to thoroughly divide the mercury with the oleate. For the first three lines of the directions as given in the Pharmacopœia, I offer the following substitute: Triturate the mercury with the oleate of mercury until the latter is thoroughly saturated; then add the Hydrous Wool Fat, and continue the trituration until globules of mercury are no longer visible. Made by these directions the formula is a practical one, small quantities being readily and easily made by the pharmacist."

EMPLASTRUM OPII.—"Is very good."

EMPLASTRUM PLUMBI.—"Is very good."

EMPLASTRUM SAPONIS.—"Is very good."

"*For spreading plasters*, I suggest the following: Out of cardboard the thickness of the desired plaster, cut a piece the size of the plaster to be made, leaving the edge entire. Tack this cardboard frame upon the cloth or leather, lying on a smooth board thick enough to be firm. Lay the whole upon a warm stove or radiator, until the board is thoroughly warmed. Then melt and spread the plaster with a spatula, distributing the mass as uniformly as possible over the cloth within the frame. Now, over the surface of the plaster pass a smooth, straight, iron rule, previously warmed. This will give the plaster an even and finished appearance. Remove from the board and trim edges as desired.

OLEATUM ATROPINÆ.—"The use of alcohol in this galenical is not necessary. Neither is there a reason for the presence of olive oil."

OLEATUM COCAINÆ.—"The alkaloid cocaine is readily soluble in warm oleic acid; and the use of alcohol is therefore not necessary. Neither is the addition of olive oil necessary."

OLEATUM HYDRARGYRI.—"A good formula and readily compounded."

OLEATUM QUININÆ.—"An ideal formula."

OLEATUM VERATRINÆ.—"Olive oil not necessary in this formula. The recognition of fixed formulas for these oleates, except perhaps that of the yellow oxide of mercury, is not necessary; and they could be dismissed. Under the various heads of several alkaloids, the information that they are soluble in oleic acid is all that is needed for the physician and the pharmacist."

SEVUM PREPARATUM.—"Cut off the 'praeparatum' part of the name. Kept in a cool place, as all fats should be kept, sevum is a useful article."

UNGUENTUM.—"The formula of 1880 and 1890 is a better one. White wax makes simple ointment too stiff."

UNGUENTUM ACIDI BORICI.—"Makes a nice product. With the rose water ointment for a base, boric acid makes a better preparation and simplifies the manipulation."

UNGUENTUM ACIDI TANNICI.—"Using benzoinated lard as a base in this ointment, will simplify the work, and result in just as good, if not better product."

Unguentum Aquæ Rosæ.—"A very satisfactory formula."

Unguentum Belladonnæ.—"A very satisfactory formula."

Unguentum Chrysarobini.—"A very satisfactory formula."

Unguentum Diachylon.—"Good, but rarely used."

Unguentum Gallæ.—"Good."

Unguentum Hydrargyri.—"Not satisfactory. I offer the following formula:

Mercury	500 Gm.
Oleate of mercury	20 Gm.
Lanolin	150 Gm.
Suet	230 Gm.
Benzoinated lard	100 Gm.

"Triturate the mercury with the oleate of mercury until the latter is thoroughly saturated; then add the lanolin, and continue the trituration until all of the mercury is completely divided and distributed. Now melt the suet and benzoinated lard together, and when about ready to congeal add to the mercury mixture. Triturate the whole thoroughly, until no globules of mercury are visible. This makes a nice preparation, and is quickly made. Without the addition of lanolin, it is almost impossible to completely rub out the mercury, especially when making small quantities of this ointment."

Unguentum Hydrargyri Ammoniati.—"Very good."

Unguentum Hydrargyri Dilutum.—"Very good."

Unguentum Hydrargyri Nitratis.—"Very good."

Unguentum Hydrargyri Oxidi Flavi.—"Very satisfactory."

Unguentum Hydrargyri Oxidi Rubri.—"Very satisfactory, if the red oxide of mercury is pulverized *very fine* before making the ointment. In other words, if the red oxide is rubbed into the yellow oxide, as a preliminary step, the ointment will be satisfactory. We then have the yellow oxide of mercury ointment made from the red oxide of mercury. It seems, therefore, that there is no red oxide of mercury ointment; but two yellow oxide ointments made by two different processes."

Unguentum Iodi.—"Very good."

Unguentum Iodoformi.—"Very good."

Unguentum Phenolis.—"Don't like this. Made with the unguentum of 1890 as a base, it will keep better, and is otherwise more satisfactory."

Unguentum Picis Liquidæ.—"Very satisfactory."

Unguentum Potassii Iodidi.—"Very good."

Unguentum Stramonii.—"Very good."

Unguentum Sulphuris.—"Very good."

Unguentum Veratrinæ.—"Very good."

Unguentum Zinci Oxidi.—"Very good."

Unguentum Zinci Stearatis.—"The use of heat in the preparation of this ointment is not good. A good smooth ointment is readily made by simply mixing the ingredients, if care is taken in using a good article of the zinc stearate, in very fine powder." (Mittelbach).

COLLODIUM CANTHARIDATUM.—"The present formula should be improved on. The formula for an acetone, cantharidal collodion proposed by the writer has proven satisfactory and keeps well. In this connection a decided advance is noted in the Pharmaco-

poa Helvetica which directs its preparations from cantharidin 1, flexible collodion 250." (Beringer).

COLLODION FLEXILE.—"The Canada turpentine in this should be omitted. The castor oil is sufficient to render the film elastic and the addition of 2 per cent. of camphor will add to its strength." (Beringer).

ELIXIR ADJUVANS.—"The title of this should be Elixir of Glycyrrhiza." (Beringer).

"Don't think this as elegant as the original N. F. If retained the proportion should be 1 to 9." (Mittelbach).

ELIXIR FERRI, QUININÆ ET STRYCHNINÆ PHOSPHATUM.—"Is not as permanent in color and otherwise as that of the N. F., 1896, and certainly no better therapeutically." (Mittlebach).

Extracts.—"The solid extracts as a class are not very satisfactory. Dry or powdered extracts as made by the manufacturers are extensively used in place of the official and are preferable." (Mittelbach).

FLUIDEXTRACTUM RHAMNI PURSHIANÆ.—"Extraction with water is recommended, and the alcohol (25 per cent.) then added to the concentrated extract as a preservative." (Beringer.)

FLUIDEXTRACTUM RHAMNI PURSHIANÆ AROMATICUM.—"In this formula several changes are suggested:

1st. "Substitute 40 Gm. of pure extract of glycyrrhiza for the powdered glycyrrhiza. Reason—ammonia not magnesia is the proper alkali for extraction of licorice.

2d. "Method of extraction of the cascara sagrada should be changed. After preliminary treatment with magnesia and water and then drying, the drug should be percolated with a menstruum of glycerin 250 Cc., water 750 Cc., and then extraction completed with water. The percolate is concentrated to 700 Cc., in which dissolve while still warm the pure extract of glycyrrhiza, and then add 250 Cc. of alcohol previously mixed with the compound spirit of orange, and finally sufficient water to make up to 1000 Cc." (Beringer.)

Glyceritum Hydrastis.—"Can be and should be made direct from the fluidextract of hydrastis. This would simplify the process very much." (Mittelbach.)

LIQUOR CHLORI COMPOSITUS.—"Instead of the present directions for making this galenical, I suggest the following:

"Place the $KClO_3$ in a *dry* container and pour the HCl upon it. Chlorine gas is immediately generated, completely filling the container in a few moments. This is readily observed by the green color of the gas. When the container is full of the dry gas, add the distilled water, in portions of 120 or 200 Cc., corking well the container after each addition. Now shake the container well, until the water has assumed a distinct green color. When all the water has been added, and the container thoroughly shaken to completely saturate the water, you will then have a strong and reliable solution of chlorine, made without the use of heat. I have used this process for many years to the entire satisfaction of my physician friends. It readily mixes with a solution of quinine in tincture of ferric chloride and syrup, thus making a powerful and useful germicidal prescription for typhoid fever cases." (Mittelbach.)

"The official will not come up to the tests laid down. A strong solution deteriorates faster proportionately than a weak solution. I suggest a weaker preparation. To make one of pharmacopœial strength requires increased quantities of both potassium chlorate and hydrochloric acid, in our experience double these quantities." (Eberle.)

Liquor Ferri et Ammonii Acetatis.—"This should be described in the U. S. P., for reason mentioned under Mistura Glycyrrhizæ Comp. L. E. Sayre suggests that the amount of incinerated residue should be stated in the test. The suggestion is a good one and applies with equal force to tincture of iodine, which more frequently perhaps is made with deficient potassium iodide, sometimes none. Sayre mentions Liquor Potassii

Citratis as an example, for which the U. S. P. states residue, though it is a preparation usually made extemporaneously." (Eberle.)

LIQUOR HYDRARGYRI NITRATIS.—"Use the yellow oxide in place of the red." (Mittelbach.)

"William Mittelbach suggests the use of yellow mercuric oxide and to drop the red from the Pharmacopœia. He has overlooked the item of cost possibly." (Eberle.)

LIQUOR PLUMBI SUBACETATIS DILUTUS.—"Should be made extemporaneously." (Mittelbach and Eberle.)

LIQUOR POTASSII HYDROXIDI.—"L. E. Sayre says: 'It is practically impossible to secure a preparation which, although preserved in any kind of glass, will not form a more or less colored precipitate.' The same may be said of Liquor Sodii Hydroxidi. This does not deplete the alkalinity. The U. S. P. should note this." (Eberle.)

LIQUOR SODAE CHLORINATAE.—"H. B. Dunning suggests the addition of the chlorinated lime smoothly suspended in the water to the hot solution of sodium carbonate (without filtration), this facilitates separation of the calcium carbonate and avoids loss on filtration. We further suggest an increase of the monohydrated sodium carbonate." (Eberle.)

LIQUOR SODII PHOSPHATIS COMPOSITUS.—"Leo Eliel suggests replacing one-half the citric acid by phosphoric acid. H. A. B. Dunning suggests the increase of citric acid to 200 Gm. The formula suggested by Scoville was 230 Gm., citric acid and no sodium nitrate. The latter is the formula I used for a number of years and was satisfactory. All of them yield satisfactory products, and are improvements over the U. S. P. formula." (Eberle.)

MISTURA GLYCYRRHIZAE COMPOSITA.—"The U. S. P. should, more than heretofore, describe the physical properties of preparations. This is an example, if made from pure extract of glycyrrhiza, the preparation should have no sediment. The pharmaceutical definition of a mixture implies an undissolved portion. Should this preparation be classed among the mixtures? Could it be termed an elixir? William Mittelbach thinks the mixtures ought not to be official preparations. I am almost inclined to agree with him. Mistura Glycyrrhizæ Composita would be about the only one I would like to see retained, and even this under present conditions might well find place in the National Formulary." (Eberle.)

Tinctures.—"Making the potent tinctures all of uniform strength (10 per cent.) was good and in line with progress. Now, let us include the remainder of the official tinctures in this list, making them all 10 per cent. With one exception this can be done. Our old friend paregoric can be given a new dress and placed with the elixirs." (Mittelbach.)

TINCTURE OF BELLADONNA LEAVES.—"The introduction of 'foliorum' in title is unnecessary." (Beringer.)

TINCTURE OF COLCHICUM SEED.—"'Seed' unnecessary in the title." (Beringer.)

"Note the inconsistency of making tincture of colchicum from the drug, involving the necessity of assaying the product, while the wine is made from a standardized fluidextract, so that no assay is needed. I contend that it is economy to make tinctures in all cases from standardized fluidextracts rather than from drugs." (Lyons.)

TINCTURE OF KINO.—"The official manipulation has negatived the object aimed at, the prevention of gelatinization. The use of purified talc is unnecessary and impedes the filtration, which, in fact, should *not* be attempted at all, as the filtration is exceedingly slow and the exposure is usually sufficient to assure early gelatinization. The process recommended is to add the kino in coarse powder to the glycerin and water and warm on the water-bath in a flask for two hours with frequent agitation, adding distilled water to replace evaporation. Then remove heat and allow to cool to 40° C., and add the alcohol, agitate, and then strain through cheese cloth, washing the dregs with a mix-

ture of alcohol 3, water 1 volume, till the product measures 1000 Cc., and bottle this at once in small vials. The small amount of sediment that forms closely adheres to the bottom of the vial and the clear liquid above is readily decanted. Samples made by this process have kept for more than two years." (Beringer.)

TINCTURA NUCIS VOMICAE.—"The present official formula directs that this be prepared by dissolving the extract of nux vomica (containing 5 per cent. of strychnine). Apparently recognizing that the preparation of extract of nux vomica by the official process is not practical for the retail pharmacist who, nevertheless, prepares most of the tincture and is responsible for its quality, the Pharmacopœia directs that this simple solution from a standardized extract be assayed.

"The powdered extracts of nux vomica of the different manufacturers vary very much in color, and this variation becomes quite apparent in the tincture, and another defect noted is that such tinctures continue to precipitate. In my experience the tincture made direct from the drug is more nearly uniform in color, is clear, and keeps without precipitation. The formula preferred and used for several years is to extract by percolation, with the official menstruum for tincture, 100 Gm. of the powdered drug till 1000 Cc. is obtained. This is then assayed and standardized to the official requirement of 0.1 Gm. of strychnine in 100 Cc. of tincture." (Beringer.)

GEO. M. BERINGER, *Chairman.*

The Chair stated that this exceedingly important subject was open for discussion. There was no need to accept the report formally, as it was a report of a committee of this Association.

Mr. Francis, of Detroit, said that Mr. Hallberg had presented a report that might very well take half a day for adequate discussion, but unfortunately the program had not been so arranged as to allow this. He desired, however, to call attention to one or two things which he assumed were not mentioned in the report. For instance, he did not consider that the pharmacopœial data justified the conclusion that hyoscine and scopolamine are identical, or that their physiological action is the same. He thought there was very great doubt as to whether this was true or not, and that it might be well to take into consideration in the next revision the question of drawing some distinction between the two, in view of the fact that hyoscine is obtained from any or all of the solanaceous drugs, while scopolamine is obtained wholly from scopola. Also, there is a similar distinction between hyoscine true, as extracted from the plant, and hyoscine derived or artificial. He thought the opinion of medical men and pharmacologists was greatly at variance in regard to the therapeutic activity of these drugs, and it deserved some further attention at the hands of the next Revision Committee.

Mr. Remington said this was a very exhaustive and very valuable report that had been submitted by the committee, and the point he wanted to discuss was the physical factors in the Pharmacopœia. As we know, there are no official methods of determining the melting and boiling points. The result is, that the melting and boiling points in the Pharmacopœia have been determined by the best methods available to the member of the committee reporting upon the subject. The Board of Trustees have

made arrangements with the Department of Public Health and Marine Hospital Service to have the whole matter gone over this summer, and an investigator is now at work in the Hygienic Laboratory determining upon the best uniform plan for arriving at the boiling and melting points, and the next step will be to harmonize the statements in the Pharmacopœia regarding these physical factors. Mr. Remington said he thought there were probably no great errors in the melting and boiling points as given, but the question was an important one, and becoming more important in view of the adoption of the Pharmacopœia as a legal standard; for these reasons these factors should follow the rule and practice in regard to assay processes. The Pharmacopœia says that opium, for instance, shall contain so much morphine when assayed by the process *given below* —not by a process that any man chooses, but by the process given in the Pharmacopœia; he thought all would see the importance of making the melting and boiling points come under the same rule. That is, as a standard, the Pharmacopœia must have a uniform plan for ascertaining all definite melting and boiling points to serve as tests for the official substances.

Mr. Cohn said he thought the same principle should be applied to solubilities, because we all know that it makes a great difference whether we take a fine or a coarse powder, and cold or hot water, and shake it well or not. Different results are had by different methods.

Mr. Schneider wanted to know whether the Committee on U. S. P. had considered the introduction of microscopic description of drugs, and Mr. Hallberg replied in the negative. Mr. Schneider wanted to know why it would not be well to recommend that this be done. He well remembered, he said, "the completeness with which he was suppressed" at Washington nine years ago, when he made the recommendation that this be done. It was never heard from—never considered; at least so far as he or Mr. Kraemer, of Philadelphia, knew, and he believed Mr. Kraemer and himself had been as active as any two men in the country with regard to this branch of pharmacognosy, or pharmacology, whatever it might be. He still thought it would be desirable to recommend this.

Mr. Hallberg agreed that the question of powdered drugs and their description and identification was a very important one, but thought there were others just as important, and he did not see why the committee should specifically recommend that feature to the exclusion of others. He thought the introductory he had read showed that the committee believed it was a desirable thing—that the committee favored it—but it was a question of expediency, as how best to bring it about.

Mr. Hallberg, replying to the remarks made by Mr. Francis on scopolamine thought the idea advanced had been pretty well exploded. There was a certain coterie, he said, who for certain esoteric purposes, tried to make the doctors believe that scopolamine and hyoscine are not identical, but all the authorities, from Schmidt and Merck to Wood, and the few we

have in this country, and also the makers, uphold the Pharmacopœia as to their being physiologically identical. Therefore, he did not think there should be any criticism on the Pharmacopœia because of having made these two alkaloidal salts identical in their general description. As to what the Committee on Revision from now on would have to do with anything of this kind, of course that was another question. This matter would have to be thoroughly investigated, just as with cactina.

Mr. Eberle moved that the report of the Committee be printed, so that reprints might be distributed among the members of the committee, and also to such persons as would be interested and offer their suggestions for the final correction and adoption of this report by the committee.

The Chair suggested that, as he understood, the Section would have to have consent to print, and the General Secretary suggested that this could be done by the Section asking the Association in general session to authorize it. Mr. Eberle said he would change his motion to that effect, then.

Mr. Hallberg stated that the different reports of the various sub-committees came in late, and it was impossible for Mr. Beringer to get them all together and get any definite expression on many of these points. Therefore, if galley-proofs were sent out to the members they could in a very short time agree on the report, and when finally printed it would have more force and weight if every member of the committee agreed on it. That was their object, he said. The cost would be merely nominal.

Mr. Remington thought the editor of the 'Bulletin' should be requested to make a notice to this effect in the 'Bulletin,' that extra copies of this report might be had by sending a stamp. This to let the members know it was available.

The Chair stated there was one matter he had neglected to call attention to, and that was, that Mr. Anderson, in his paper on tetanus antitoxin passed on a few moments ago, asked for the introduction of tetanus antitoxin in the Pharmacopœia, and it might possibly be well for this Section to go on record as either favoring or not favoring his suggestion. He says that the Government has already established a standard for this country, and that such foreign manufacturers as wish to market their product in this country must comply with the established standard. Also, that such standard has already been introduced into a number of the foreign Pharmacopœias, and he believes it would be advantageous to include it in the United States Pharmacopœia, with directions for keeping and preserving the activity of the serum.

Mr. Remington said he would so move, that tetanus antitoxin be included in the next edition of the U. S. Pharmacopœia, with the proper tests and standards, and Mr. Hallberg read the following formal resolution on the subject:

WHEREAS, Tetanus Antitoxin has come to be recognized as a valuable addition to the Materia Medica; and,

Whereas, One of the objects of this Association is to foster uniformity in medicaments by establishing standards for strength and suggesting methods for preserving; now, therefore, be it

Resolved, That the Section on Scientific Papers suggests that the American Pharmaceutical Association, in general meeting assembled, instruct its delegates to the forthcoming Pharmacopœial Revision Convention to ask for the admission of a standard for Tetanus Antitoxin in the next revision of the Pharmacopœia of the United States.

The Chair put the vote on the resolution, as offered, and it was adopted.

The Chair stated that this concluded the program of the morning, with the exception of the nomination of officers. He invited nominations for Chairman.

Mr. Cohn nominated Mr. Wilbert, the acting Chairman, for that office for the ensuing year, and this motion was seconded by Mr. Hallberg.

Mr. Hallberg said he would like to nominate for Secretary a gentleman who had been looking forward to this meeting for a whole year, and who was disappointed because he could not be here. He referred to A. H. Clark, of Chicago, the present Associate on the committee. Mr. Francis seconded the nomination. The Chair stated that Mr. Clark had been very active in the past, and would render valuable assistance on the program.

There being no further business before the Section at this time, the Chair declared an adjournment to 8 p. m. this date.

Second Session—Thursday Evening, August 19, 1909.

The second session of the Section on Scientific Papers was called to order at 8:15 p. m. in a room adjoining the banquet-hall of the Hotel Alexandria, with Acting Chairman Wilbert presiding, and W. O. Richtmann, of Florida, acting as Secretary.

As the first order of business, the Chair called for further nominations for officers of the Committee on Scientific Papers, stating that M. I. Wilbert, of Washington City, was in nomination for Chairman, and A. H. Clark, of Chicago, for Secretary.

Mr. Caspari moved that nominations be closed, and that the Secretary be directed to cast the ballot of the Section for the nominees mentioned. This motion was carried. The Secretary announced that he had cast the ballot, and the Chair declared these gentlemen duly elected.

The Chair called for a paper on Cascara Sagrada, by two gentlemen connected with the Bureau of Plant Industry, at Washington, and Mr. Sievers, in the absence of the writers, presented the paper:

THE CULTIVATION OF CASCARA SAGRADA.

BY R. H. TRUE AND G. F. KLUGH.

All reports received from the present commercial sources of *Cascara Sagrada* point toward an eventual shortage in this article unless means are adopted to prevent it. According to Zeig and Brown the present methods of collecting the bark result annually in the destruction of a large number of the trees. The rather rapid removal toward the north of the center of activity from northern California to southern Washington, indicates that at present prices bark gathering is less profitable in the older regions than in the newer. This may be assumed to be due to a number of conditions, chief of which, perhaps, is the scarcity of bark within a reasonable packing distance from transportation points, although bark gathering as a means of livelihood has doubtless more and more given place to more profitable industries.

Even at the more northern stations, the supply of available bark is now being brought in from considerable and increasing distances. Since the northern limit of this tree in commercial quantities seems to lie south of the middle of Vancouver Island, the question of a future supply of this important drug deserves consideration. A number of possibilities are suggested: (1) An acceptable substitute may be developed in the related, widely distributed species, chiefly *Rhamnus Californica* Eschb., although this bark is now generally regarded as an adulterant and is capable of detection on account of microscopic differences and color tests. A recent revision of these western forms of *Rhamnus* by Dr. Geo. B. Sudworth of the Forest Service, merges *Rhamnus Californica* with *R. Purshiana*, the recognized source of *Cascara Sagrada*. Should this interpretation of *Rhamnus Purshiana* receive the official sanction of the pharmacopœial convention, the bark now excluded as *Rhamnus Californica* would receive official standing and widen considerably the available supply of bark. Whatever may happen, *Rhamnus Californica*, or the form known under that name, is, either rightly or wrongly, under the ban and will probably need a thorough pharmacological comparison with *Rhamnus Purshiana* to establish it in the eyes of pharmacists and physicians. It is the purpose of this office to carry out such a comparative study in the near future.

(2) Another possible protection against shortage may be found in the conservative handling of trees not already killed. Doctor Sudworth of the Forest Service states that when properly managed, the stumps of *Rhamnus Purshiana* give off sprouts capable of being utilized. Work in the Forest Service along this line is contemplated.

(3) A third possibility lies in growing the trees as a planting operation. During the past six years this office has carried on a series of studies along this line, and in this time grown plants from seed. The cascara tree, when planted in a moist situation, thrives well at Washington, our trees in six years from seed having reached a height of from 10 to 12 feet.

It has proved feasible by a system of pruning, to force the top into the form of a three or four branched head, from which one branch per year is cut for peeling. The proper bud being allowed to develop, the place occupied by this branch is immediately taken by a small shoot desired for cutting some few years later. Thus the same stump supports a crop of branches which are cut and removed in such a way as to provide for an annual harvest of bark. This year the branches taken from six-year-old trees yielded at the rate of 500 lbs. of dried bark per acre of trees. We hope that the average annual yield of established trees will materially exceed this weight.

The bark collected last April was carefully cured and in part made up immediately into bitter fluidextract and aromatic fluidextract according to the present pharmacopœial methods. These preparations were tested on six males and six females, ranging in age from eighteen months to sixty-five years, in the usual doses. Experiments were made with like preparations in the same doses, made from the best aged commercial barks. The effects produced by the cultivated bark could not be distinguished from the results obtained with the commercial material, and no evidence of nauseating or griping action due to a lack of aging of the cultivated bark was observed. The whole question of the necessity for aging cascara bark suggests an investigation, now planned in this office.

In view of the favorable results obtained, it appears probable that Cascara sagrada can be cultivated not only in its native habitat but also over a considerable area in the East. The wet slopes of the mountains of Virginia, North Carolina and Tennessee seem likely to be very favorable for this purpose. Under present commercial conditions the cultivation of Cascara Sagrada in the East seems to promise fair profits when compared with the results obtained with the common crops now grown in the regions favorable for cascara culture. It would be relatively easy, however, to overstock the market if large areas were devoted to cascara culture in the immediate future.

Office of Drug Plant Investigations, Bureau of Plant Industry, Department of Agriculture, August 6, 1909.

The Chair invited discussion on the paper.

Mr. Asher said he would like to ask the gentleman who had read the paper if the authors had data of the longitude and latitude on this subject. Mr. Sievers replied that as he was not the author of the paper, he did not know much about it, but thought probably the authors had these data. In reply to a further inquiry from Mr. Asher as to what sort of environment was necessary, Mr. Sievers said he thought the plant grew very well in southern Washington, in the eastern part of the state.

Mr. Richtmann suggested that Mr. Johnson, of the University of Washington, could probably enlighten the Section on this subject, but Mr. John-

son said he had never, unfortunately, been out in the cascara-growing parts of Washington, or of Oregon either, but as he understood it, it grew more like the alder grows, where it is moist, in the western part of Washington and Oregon, along the foot-hills of the mountains. If Mr. Rusby were here he could tell the members all about it, because he had just come from the cascara forests.

Mr. Richtmann went on to state that, while he was connected with the Department of Agriculture three or four years ago, he went through this area where cascara is now being collected, and he recalled that, a number of years ago, the area extended well down into California, and through Oregon up into Washington, and even on up into British America. The area from which the bark was then being received, however, only included the state of Washington and on up into Canada, the California and Oregon areas being largely depleted. Whether these conditions obtain now or not, he did not know.

Mr. Francis asked if cascara grew naturally in areas subject to a low degree of temperature—say 10 degrees below zero. Mr. Richtmann replied that he did not know how low the temperature went in this section, but he imagined not very low. Generally speaking, the plant prefers a moist, shaded soil.

The Chair stated in this connection that Mr. Klugh had quite a collection of trees at the experiment-garden at Washington, ranging from one to six or seven years, and had had no trouble with them at all, and they appeared to grow quite rapidly—as rapidly as the ordinary forest tree would—and did very well. So that even in the East there were promising possibilities.

Mr. Francis said the firm with which he was associated had grown these trees from the seed, in the vicinity of Detroit, subject to a temperature of 20 degrees below zero, with ordinary exposure. He did not know, however, that this would be a sufficient experience to base the statement upon that they could be planted and grown as an ordinary farm product in the latitude of Michigan. These trees seem to stand the temperature very well, and they have some pretty severe weather there. Mr. Francis said also that the writer of the paper had suggested one point of considerable interest. He suggests the possibility of relieving the situation as to Rhamnus Purshiana by the substitution of Rhamnus Californica, and the author intimated that Rhamnus Californica was more abundant in some portions of the cascara territory now than Rhamnus Purshiana. He saw possible danger in this suggestion, unless it was backed by very careful and competent clinical tests. There is reason to believe that a very considerable part of the cascara bark now in commerce, and for several years past, has not been the true bark, but quite a considerable part of it has contained more or less of the bark Rhamnus Californica. Therefore this presents a problem that is well worth very careful consideration. He did not think

too much encouragement should be taken from the suggestion of Mr. True—in fact, he did not think the author intended that should be done.

The Chair called on Mr. Sievers, of the Bureau of Plant Industry, to read a paper by R. H. True on the methods of the plant breeder as applied to drug plants, and Mr. Sievers presented the paper as follows:

BREEDING DRUG PLANTS.

BY RODNEY H. TRUE.

The term breeding in the sense here used has become so familiar, especially in recent years, as to render a definition unnecessary, but a few words concerning methods of operation may not be out of place. Plant breeding has for its object the modification of the plant in such a way as to fix desirable characteristics and to eliminate undesirable ones. The characteristics sought may already occur in the plant in a more or less undeveloped degree and may need to be strengthened. Sometimes the characteristic required in a particular sort must apparently be introduced from another.

The methods used by the plant breeder may be grouped under two headings:

1. Selection, which seeks to emphasize or reduce characteristics, operates on large numbers of plants, from which those individuals most closely approaching the desired product are retained for propagation, the remainder being discarded. By continued propagation of the most desirable plants, the ideal is gradually approached and in time is fixed as a relatively permanent type.

2. Sometimes the individuals of the stock may show little tendency to variation; in these cases selection has little opportunity to effect progress. Sometimes desirable characteristics are persistently coupled with undesirable ones. In order to render a stable plant more variable, or in order to break up old combinations and introduce new and possibly more favorable ones, crossing with nearly related forms possessing the good points sought is resorted to. Crossing is but a preliminary step to secure an increased degree of variation or to secure a new arrangement of characteristics, and constitutes in either case but a process preliminary to selection. From the many new combinations arising, those most nearly approximating the ideal are in these cases also selected for propagation until the undesirable characteristics are weeded out and the desirable combination is more or less completely realized.

Plant breeders have given their attention for many years more or less consciously to bettering our fruits, our vegetables and ornamental plants. In these cases the object sought has generally been an increase in size or an increase in amount of production. In other cases, color arrangements have been sought. Usually visible, external characteristics have been the objects of breeding operations. In general, hidden chemical character-

istics have not been prominent as objects of search. Certain striking exceptions occur to qualify this generalization. Pharmacists are familiar with one of the most brilliant early successes along this line in the striking increase of alkaloidal content of the cinchona trees as seen wild in the Andes compared with those yielding the striking percentages obtained by scientific cinchona growers of the East. The great increase of the sugar content of the sugar beet through cultivation and selection is another conspicuous example of plant breeding successfully applied to a problem concerning a chemical plant constituent. A more recent and very successful instance is seen in the breeding of field corns for starch and for oil. Wheats are now being bred for the special purposes for which they are desired, the starch or the gluten being proportioned according to the use to which the wheat is to be put. The number of instances of breeding designed to modify definite chemical characteristics is, however, small when compared with the host of instances of breeding carried out in order to influence size, form or color characteristics. The reason for this, though not far to seek, is somewhat aside from our present path.

Pharmacy and medicine are now facing very trying times in the matter of crude drugs of great potency. As long as belladonna was belladonna and nothing more, the matter was simple for the pharmacist, while hard for the patient and for his physician, but when it was recognized that belladonna was alkaloids, and a very variable quantity of alkaloids at that, in short, when standards of activity were introduced and a required proportion of active principle was specified, the trouble was transferred from the physician to the crude drug dealer and the pharmacist. It now appears that much of the stock of crude drugs of the more potent sorts is deficient in active principles, and the search for a suitable supply is being eagerly prosecuted.

In the office of Drug Plant Investigations, of the Bureau of Plant Industry, of the United States Department of Agriculture, work is being planned and carried on, which has for its object among other things, the introduction and cultivation in this country of an adequate and satisfactory supply of drugs. To pass over the preliminary steps of introduction and establishment of the plant stocks, we face the more difficult step of securing a satisfactory amount of active principle. We have introduced and for years have grown fine belladonna plants, but sometimes the alkaloidal content is high and sometimes on the same ground, in the same season, it is low. In other words, in belladonna, as in so many other members of the *Solanaceæ*, such as the red pepper, the tobacco and the potato, we seem to have a highly variable object, varying in the case of belladonna not so conspicuously in its general form characters as in its chemical characters ; and this plasticity seems in all probability to lie at the bottom of the trouble which crude drug dealers are having with belladonna, wherever an alkaloidal standard is in effect. The same general

situation apparently prevails with the related plants, henbane and stramonium. Here, then, if I am right, is a situation in which the work of the plant breeder is required to select such individuals as show the desired combination of chemical and form characteristics and if possible to fix a new and higher level, not only of gross yield of leaf and root but also a higher rate of alkaloidal production than now obtains. This same door seems to stand open in relation to *Stramonium*, *Hyoscyamus*, and several related species.

In connection with the work of the Office of Drug Plant Investigations of the Bureau of Plant Industry, steps have been already taken to inaugurate such a study of the solanaceous and other plants. It has been recognized that the plant physiology of alkaloids offers a very difficult problem to the botanical investigator and many views have been advanced as to the function performed in the plant by these substances. In general, however, they are regarded as products of metabolism existing probably in the plant, perhaps playing the rôle of waste products. At all events while they seem to be connected with the nutrition function, the quantity of alkaloid formed varies strangely under apparently but slight variations in the environment. This seems to indicate that the source of variation may lie in the fundamental characteristics governed by heredity, rather than in the more superficial affairs of the environment. In order to test this situation, a series of plantings of a number of active drug plants is being made into soils which vary chiefly in the fertilizers used. Some plots are rich in potassium, others in phosphates, others in calcium, others in organic nitrogen, others in inorganic nitrogen, and still others receive the complete formula. We hope, if alkaloid formation depends on feeding, to find some indication that may point toward the most favorable conditions of the soil. In order to ascertain the extent of individual variation apart from soil differences, a large number of individuals grown under like conditions are to be studied with reference to their variability in alkaloid content. We hope by these and further experiments, in part already well advanced, to get light into this dark corner.

Not only do the alkaloidal drugs need this kind of study, but perhaps equally is it demanded for digitalis. Here the difficulty is increased by the doubt that hangs over all chemical methods of standardizing this drug. As a result, variation in the plant must be studied on variable animals. However, the attempt seems worth making.

Also, in the plants yielding volatile oils, a study of individuals with reference to the quantity and constitution of the oil promises interesting results. Here the method of procedure requires time, since each mint plant must be propagated by root division and cuttings until there is a patch of mint large enough to yield an oil sample sufficient for a thorough study of its chief constituents. The preliminary propagation of a sufficient area from a single individual takes not less than three years. We are

finding, however, that most interesting and perhaps important results may follow. It may pay to select an especially rich plant and multiply it until it yields an area of herb sufficient to produce oil on a commercial scale.

It would take more time than I can claim to illustrate further the practical operation of the science of plant breeding applied to drug plants as being now attempted in the work of this office. I cannot close, however, without expressing the conviction that as progress in one branch of science always aids others, so the science of plant breeding has much in store for pharmacognosy and for medicine.

Bureau of Plant Industry, United States Department of Agriculture.

The Chair invited discussion on this very satisfactory paper by Mr. True.

Mr. Remington led off in the discussion of the paper, and said that it seemed to him that plant breeding opened up some great possibilities as to the future of drug plants. It had been found years ago by the Shakers, at New Lebanon, New York, who undertook to cultivate medicinal plants on a considerable scale, that the cultivation of such plants as belladonna and hyoscyamus, and those containing mydriatic alkaloids particularly, where they produced plants of handsome leaves and sometimes very fine roots, the proper proportion of active constituents was lacking; and this has been one of the troubles in regard to crude drugs that have been cultivated. This paper suggests the possibility in the breeding and growing of plants of diminishing the leaf growth, for instance, where the active principle is found in the root. He believed—although it might be a pure guess—that by working in the opposite direction from that in which the Shakers operated (of making a handsome plant), by pruning and diminishing the growth of the plant in non-essential particulars, a stronger medicinal plant might be produced. In cinchona, where the alkaloids are increased by mossing without injury to the tree, there is an illustration of what the intelligence of man can do. He certainly hoped that the investigations would go ahead, and he believed the time would come when the gentlemen doing this work would hit upon some plan or devise some scheme by which we shall get only good roots and barks and leaves and stems, which will not only contain a high proportion of alkaloids, but definite yields. In other words, may we not look forward to the time when these gentlemen will become so successful that they will be able to furnish roots and leaves containing definite quantities of these alkaloids?—perhaps as definite as the assay processes of the Pharmacopœia require.

Mr. Schneider, at the suggestion of Mr. Caspari, related some experience he had along this line—in fact, more "experience" than anything else. This was especially true since he had come to the Pacific Coast. He expressed an opinion, based on experience, that an enterprise along the line of Mr. True's paper could not be undertaken by an individual. It must

be undertaken either by the State or Federal Government, or by wealthy corporations or individuals. In 1887, for example, the University of California attempted the introduction of cinchona into the state of California. They made some very strenuous attempts, but with very slight success, and unfortunately the effort was not pushed farther. When he arrived on the Coast he got the idea that it was possible to grow cinchona in California, and he made an attempt to get assistance from Washington through Mr. True, but got no encouragement whatever, that gentleman stating that the Department had so much work before it, and the amount he had suggested was many times more than the Department was allowed for that class of experiment. Neither could he persuade any wealthy individuals or big corporations to go into this venture, and so he had to give it up for the time being. Finally, however, he persuaded a wealthy corporation to take it up, and go into the raising of belladonna on an experimental basis. This firm was Messrs. Johnson & Johnson, of New Brunswick. Mr. Schneider said he had a paper on the result of his efforts in this direction, but it would come up before the Historical Section. He would state, however, that at considerable cost, and after expending considerable energy and getting a whole lot of experience, he had found out now how to grow belladonna in this section of the country. His experience was, that the alkaloid yield of California belladonna was quite uniformly high, the analysis showing, as he remembered, that that from the stems and leaves ran from .4 up to .8 per cent., it being unusually high in the stem, as shown by Dr. Kilmer. This belladonna can be grown profitably only when the stems and leaves are used, and the producer could not possibly compete with the foreign article otherwise.

Mr. Howell, of North Carolina, said he was particularly interested in opium at one time—that most everybody has an "opium spell" at one time or another. He had between five and ten thousand poppy-plants in cultivation last year, and he got opium running 6 per cent. of morphine. The young plants he ate with mayonnaise dressing, "and they were all right!" He described a number of personal experiences, some of them rather amusing, along this line. Most of his efforts came to nothing.

Mr. Francis said that Mr. Remington's very encouraging trend of thought led him to suggest that perhaps Mr. True and the Department of Agriculture should be encouraged to continue their efforts in hybridizing and crossing of plants, so that finally he would by crossing colocynth and jalap with various other plants have a compound cathartic pill plant. He said Mr. Remington did not quite reach that climax, but he wanted to suggest it to him: In fact, he did not see how he had missed it. Referring to Mr. Schneider's paper, he said there were three drugs very important in pharmacy, namely; cannabis sativa, belladonna and digitalis; and all three could be grown with success in the United States. He had reason to know that scattered in the highways and byways of this great

State of California that there was an untold quantity of digitalis of first-class activity. It only required a sufficiency of cheap labor to get it out and put it on the market. His house had tested samples of digitalis from California and adjoining states in every way as good as the imported digitalis. But the manufacturer looks at it as a matter of dollars and cents, and purchases it where he can purchase it the cheapest. He said Mr. Schneider had brought out the peculiar phase of this matter: He can grow the belladonna plant in California that tests as high as any—a very efficient drug. Yet, under a strict construction of the U. S. Pharmacopœia, his drug is not marketable to-day, because this authority permits the use only of the *leaves* and *root*—not of the "tops" or whole plant. Because labor is so expensive in the United States the American drug cannot compete with the foreign-grown article. As to cannabis indica, Mr. Francis said it was grown in various parts of the United States, particularly in Kentucky, Tennessee and Minnesota. This cannabis indica is indistinguishable in its therapeutic effects from the East Indian cannabis. This drug can now be procured in practically unlimited quantities, fully equal to the imported article, and at a less price. The speaker thought he was correct also in stating that an export tax on cannabis is required by the British Government; so we have three drugs that can be successfully procured in the United States, cheaper in one instance, and of better quality generally than they are to be procured abroad. But our drug growers and Mr. True's Department are confronted by the need of making the cost of production of belladonna and digitalis as low as that of the foreign article.

The Chair said that as Mr. Francis had brought up the question of cannabis indica, he would state that the Section had another paper on this very subject, and if desired it could be read in full.

The General Secretary said he was a little surprised to learn that Mr. Schneider's paper was to be read before the Historical Section; that if he understood the scope and office of the Historical Section properly, the paper hardly belonged there. He thought it would be very desirable if this paper could be read before this Section at this time, in connection with the paper by Mr. True. He thought it was a matter that the Section might decide for itself, but he did not know how Mr. Schneider felt about it.

Mr. Schneider said he had nothing to say, that it was up to the Section; that by some mistake or other the paper was before both Sections.

The Chair stated that the paper by Mr. Schneider was not upon the program of the Section on Scientific Papers, but if the members of the Section so desired, Mr. Schneider would doubtless be glad to present his paper. He said he was sure the paper would contain information that would be of interest to the members.

Thereupon, at invitation of the Chair, Mr. Schneider proceeded to give

an abstract of his paper on "Belladonna Culture," the full text of which here follows:

BELLADONNA CULTURE IN THE UNITED STATES.

BY ALBERT SCHNEIDER.

This paper is essentially historical, and the full title should be "The History of the Introduction of Belladonna Culture into the United States." The introduction of a new enterprise usually represents a vast outlay of time, money and experience. The introduction of cinchona culture into India by the British government and into Java by the Dutch government, cost these two nations millions of dollars, besides years of time before the enterprise was firmly established. The United States paid out vast sums in bounties to establish and encourage the sugar-beet industry. Other industries have been established by wealthy individuals or large corporations. Thus the name of Johnson & Johnson will ever be intimately associated with the introduction of belladonna culture into the United States and in this well-known firm of manufacturing chemists, it is evidently F. B. Kilmer who acted as the prime mover in this new enterprise.

It is impossible to know of each and every small or individual experiment that has been made with the growing of belladonna in the different sections of the United States. Some of these will be mentioned, though it is highly probable that others equally important are not mentioned simply because they are unknown to the writer. A letter of inquiry addressed to Dr. Rodney H. True, of the U. S. Dept. of Agriculture, Bureau of Plant Industry, Division of Drug Plant Investigation, elicited the following reply:

WASHINGTON, D. C., MAY 22, 1909.

Dear Sir: I have your note of May 15th concerning the cultivation of belladonna in the United States, and assume that you are not interested in the numerous small experimental patches which may have been seeded at one place or another, more out of curiosity than from any other motive. On a commercial basis, I know of no attempts to cultivate belladonna in this country aside from those of the J. Elwood Lee Co., Conshohocken, Pa., and the Johnson & Johnson attempts at New Brunswick, N. J.

Yours very truly,

(Signed) R. H. TRUE,
Physiologist in Charge.

Samuel Wright, Superintendent of J. Elwood Lee Co., states that thus far the experiments with the growing of belladonna in the East have not been very successful, though they are making some tests which cannot as yet be reported upon. Of the purely experimental plantings on a small scale, those by John R. Rippetoe are very interesting, and I hereby quote his letter in full:

NEW YORK CITY, JULY 27TH, 1909.

MR. ALBERT SCHNEIDER, SAN FRANCISCO, CAL.

Dear Sir: Pardon my delay in replying to your recent communication, but have been trying to get a little more information before replying. My experience in growing bella-

donna consisted of sending some seed from plants grown in New Jersey to some friends in Virginia, where plants were grown in the Shenandoah Valley at about 1,200 feet above sea level. The seed was sown in January, 1906, and transplanted several times before setting out in the open in June. Many of the plants died before becoming adapted to the change, but those that grew became very hardy, and by September had reached a height of about 30 inches, and leaves collected at this time assayed .32 per cent. About two-thirds of the plants withstood the winter, and with the first signs of spring began to grow, and by fall averaged about 5 feet in height. Samples of leaves collected in July assayed .68 per cent., and in October .48 per cent.; the root collected in October assayed .38 per cent. The plants withstood the second winter, and the next summer grew about the same as the previous season. I did not receive any samples for assay during the season, as I think I fully demonstrated the practicability of growing the plant in that section. I was trying to learn if the plants were still growing, hence the delay in replying to your letter, and if I hear anything in the near future, will communicate with you, but I haven't the least doubt they are still holding their own. The plants were in a sandy soil and almost completely shaded by peach trees.

Hoping my tardiness has not inconvenienced you, and that the information may be of some value, I beg to remain

Yours truly,

(Signed) Jno. R. Rippetoe,
570 E. 133d St., New York, N. Y.

John A. Borneman, of Philadelphia, reports on his experience with belladonna in Philadelphia as follows: Seeds are put in (covered) in early April. The young plants were transplanted into rich soil when they had reached a height of about six inches. Twenty-five per cent. of the plants were lost in transplanting. By the middle of June the plants are about 25 inches high and blossom about the middle of July. Two crops of leaves can be harvested in one season, the first the end of July, the second the latter part of October. The roots must be taken up about the latter part of October and placed in a shed to protect them from freezing during the winter. Early the next spring the roots are separated (four to six rootlets) and transplanted. The yield of one acre is from six to eight thousand pounds. In 1908 the yield from ¼ acre was 1,800 lbs. (It is, however, not stated whether this is dry or green weight.) It is a notable fact that home-raised seed germinates much better than foreign seed.

The following is a brief outline of the Johnson & Johnson belladonna experiments in the East—both the several small garden tests and the commercial experiments. I give the report in full, just as it was submitted by F. B. Kilmer:

"My own connection with the cultivation of belladonna in this country dates back to 1899, when I brought from Europe some plants and seeds of belladonna, planting a portion in my own garden, and a few in what is known as Belleview Gardens, on the farm of Mr. R. W. Johnson, President of Johnson & Johnson.

"These experiments were continued from year to year for the next two or three years, planting rows twenty-five and fifty feet in length, in various

classes of soil, poor and rich, heavily manured with farm-yard manure, fertilized with various fertilizing salts, etc., and assays made from the plants at various stages of their growth, as well as horticultural experiments, in an attempt to produce larger size plants. In 1904 the experiment was extended to fifteen acres, 150,000 to 200,000 plants being set out in this plot. The method adopted in this plot was to start the seeds in beds and boxes in the conservatory in the month of February and transplant to the open ground in May. We never succeeded in this climate in securing plants from direct planting of the seeds in the ground, although in my own gardens I have plants now growing which are the result of self-sown seed. The plants in this climate mature late in September.

"The largest plot used by us was a piece of flat land on the banks of the Raritan River, the soil of which is a rich loam formed from deposits made from the river's overflow, together with washings from adjoining hills. It afterwards developed that the soil of this plot was too rich, and that it was also too wet for the successful growth of the plant.

"The largest crop grown by us was hand-picked, during which experiments were made in various modes of handling, curing and preservation. Some observations made may not be out of place: For example, we found that when the plant is just beginning to form berries the alkaloid is maximum in the leaf and stalk; as the plant grows older, more of the alkaloidal constituents seem to be deposited in the root and less in the stem and leaf. In the older plants the percentage found in the root increases at times to quite a remarkable degree. But all of this increase is only up to a certain point; here it seems to end no matter what method of cultivation might be pursued.

"Some physical observations of the plants were made, among which are the following: The belladonna plant in the field seemed to have no distinctive odor, but the moment a branch was torn from the stem, and especially during the manipulation of drying, etc., the odor became heavy and disagreeable—sometimes nauseating. The green plants taste not unlike any other bitter weed, but by additional chewing the taste peculiar to the proper drug is developed.

"In experiments made in regard to the green color of the stem and leaf, it was found that this could be varied at will; plants quickly dried retain the green color, plants slowly dried in a dark place become brown and dark. Under a process of sweating and drying the green color was entirely eliminated.

"Our observations were also to the effect that the plant seemed to thrive best in good loam soil, rich in lime. In our experiments the young plants were found to be very tender, injured by strong sunlight, but when once well started under fairly favorable conditions, would grow and come to bloom in from six to eight months from the seeding. The tops are killed by the fall frost, and the plant entirely killed in our winters, although the writer has plants in his gardens that are five years old.

" In our larger plantings the plants were set out two feet apart, in rows, about four feet between the rows. It was found that it was required to keep the weeds down while the plant was young, either by hand, or hoeing or horse cultivating. We succeeded in growing a number of plants two feet high, and in one or two instances three to four feet high. The whole plants when dried weighed from one-half to one and one-half pounds."

" In our plantings no diseases attacked the plants, but they were attacked by flies and also by the well-known Colorado potato beetle."

" Our experience with various fertilizers was not successful. That is to say, a good fairly rich ground containing plenty of lime gave the best results."

" Under our direction many experimental plantings have been made as far north as Maine and as far south as Florida. The results, however, have been too meager to report. Rippetoe reported results of a few plants cultivated in Virginia, as recorded in the American Journal of Pharmacy. All of these experiments were done with seeds or plants furnished by Johnson & Johnson."

" Most of the experimenters have become discouraged after one or two years' work. We are now making an experimental cultivation in Pennsylvania on a few acres of very good limestone soil. A few plants on this ground last year gave most remarkable results as to size."

The preceding sums up the belladonna cultural experiments in the East. The following is a brief report of the tests made on the Pacific Coast (California). In order that the reader may understand the differences in methods and results, the following brief report on the climatology and soil of California is submitted :

California has over 800 miles of coast, and the coast climate is not unlike that of the coast of Spain. With irrigation and cultivation the pastures are green the entire year. Poultry men make no provision for cold. Evergreens predominate. Palms, oranges, lemons, camphor, cinnamons, and many other subtropical plants are abundant. Frosts are few and snow is very seldom seen in the valleys. Thunder-storms are very rare, cyclones unknown. There is a rainy (Nov.–March) and a dry (May–Oct.) season.

During the summer months the prevailing winds are from the southwest (coast winds, not trade winds, as is generally supposed), and for some ten months in the year they come every day about noon, lasting until evening, with the regularity of clock-work. The force of these winds varies much in different localities. For example, they are very strong in the upper Salinas Valley, much stronger in San Francisco than in Berkeley right across the bay, very mild or barely noticeable in small protected valleys, etc.

The range in temperature from the extreme north to the extreme south of the state differs by about ten degrees only, showing a most remarkable

uniformity in gradation, though there are equally remarkable slight local variations. To illustrate, the rainy season of San Francisco is chillier than that of Berkeley, the mission district of San Francisco is warmer than the region about Golden Gate Park.

The soil of California is sedimentary, and is very variable in its richness. In the bay regions and the coast valleys there is some very rich soil varying from quite heavy black adobe to rather light sandy. The heavier adobe soils pack under the heavy rains, but are very productive under suitable culture. The sandier soils are more amenable to cultural operations, but become impoverished sooner. The medium adobe soils yield big crops of potatoes, sugar beets, tomatoes, barley, garden truck generally, and fruits of various kinds.

Irrigation is a very important factor, and is receiving more and more attention each year. In the immediate bay region irrigation is not practiced and it is declared to be unnecessary. The writer is of opinion that even where irrigation is not necessary, it is, nevertheless, profitable. Irrigation by flooding is practiced largely on the larger ranches and in pasture areas. Furrow and row irrigation is practiced for some crops and for garden truck. Crop irrigation should be by the row or furrow method, as it yields best results.

In 1903 some belladonna plants were started in the Garden of Medicinal Plants in Golden Gate Park, San Francisco. The soil in which this belladonna was grown is "made soil" consisting of sand and dirt hauled in. In fact this is the nature of the soil of the entire park area. The belladonna received a very little care, and thrived well. The second year's growth made its appearance in January, and the young shoots were not injured by the occasional frosts. The third and fourth years' growth was even more rank than the second year's growth. Several dried samples of stems and leaves submitted to Johnson & Johnson (F. B. Kilmer) for analysis showed a high yield of alkaloids, also borne out by analyses made at the California College of Pharmacy; the yield ranging from 0.4 to 0.8 per cent. in the leaves. The alkaloidal yield of the stems was also high, 0.5 per cent. as given by Kilmer. Briefly summed up, belladonna grew exceedingly well in the Garden of Medicinal Plants in Golden Gate Park.

In 1906–07 while the writer was employed as pathologist and physiologist of the Spreckles Sugar Company, belladonna was grown in the back yard of a residence in Salinas, California. Seeding in the open was done on Jan. 14, 1906, the first seedlings appeared on March 2nd, of the same year. The soil was of the rather heavy adobe variety, which was well packed by the unusually heavy rains of that season. The plants made an excellent growth, flowering in July. Analyses made by Kilmer again showed high alkaloidal yield. Experiments made at this place would indicate that it is possible to grow two crops in one season, with irrigation.

This experiment could however not be followed to its conclusion because of the writer's removal from Salinas in July. The new tenants dug up and destroyed all plants on being told that they were poisonous.

In 1906 arrangements were made to carry on some belladonna experiments at the experimental gardens of the University of California, under the direction of R. E. Mansell, in charge of the field experiments, to which Johnson & Johnson subscribed $75.00. Cold frame sowings were made in December 1906, and a few plants (200) were transplanted in very poor (gravel, clay and adobe) soil on the top of a ridge, in the month of May, 1907. The soil was very dry and hard and there was no arrangement for irrigating. Plants made very poor growth, flowering in August. A few plants were killed by the drought, the rest barely survived and some of these were again transplanted in Dec., 1907, in soil even poorer than that just referred to. The plants received absolutely no care, and in March the soil was perfectly dry and almost as hard as a rock. The plants began to grow in January and did well until the drought checked them. At this writing all of the plants are dead as is also other vegetation (weeds) in the same area. This experiment, though a failure in a general way, proved that belladonna, after it is once well rooted, is very resisting to drought. Plants that are not well rooted before the dry season sets in make a very poor growth. Other small trial plantings have been made at Ross Valley, near San Francisco, by F. A. Hund, who reports success in every way, and by Mr. Geo. A. Hill, in Los Angeles, who reports that the plants are doing well (seeded in the open).

The sum total of results from the small experimental planting above referred to led to the conclusion that certain areas in the coast region are peculiarly suited to the growth of belladonna. As far as is known all belladonna experiments carried on in the State of California or anywhere in the West, for that matter, were made by the writer, or under his supervision or at his suggestion. Several small experiments begun this season are not referred to because no definite report has been presented to date. The seed used in making the experiments above referred to was furnished by Johnson & Johnson.

After considerable correspondence with Johnson & Johnson through their representative F. B. Kilmer, it was agreed that the writer should attempt a belladonna experiment on a commercial scale in the State of California. Beginning with July 1, 1907, writer began arrangements for this commercial experiment. Salinas Valley, Pajaro Valley, Santa Clara Valley and the San Francisco bay region were visited, climate and soil were carefully studied. Some soils were absolutely unfit for the purpose and in other instances the climate was believed to be unsuitable. After very careful deliberation a tract of 32.28 acres was selected in Castro Valley (Alameda Co.) as being perhaps the most suitable considered from all view points. The soil is of the medium adobe sedimentary variety, quite

uniform in quality and as yet not much overrun by the morning glory. Tomatoes had been grown on this land for the two years preceding, yielding from 12 to 18 tons per acre, which is a remarkably high yield, indicating that the soil is very rich. The average rainfall for this valley is about 20–22 inches, somewhat less than for San Francisco. The valley is small, perhaps 2000 acres in all, and well protected on all sides by low hill ranges. The usual fogs prevail but there are are more clear days than in San Francisco and fewer frosts during the winter months. The soil holds the moisture to a remarkable degree, in fact it was this characteristic which first attracted the writer's attention. This is in part due to the physical condition of the soil and in part due to the water seepage from the surrounding hills.

Arrangements were made with Mr. John Stanton, the owner of the land, to do the heavy field work as plowing, discing, harrowing, etc., and with T. Weyno, a Japanese foreman or labor contractor, to do the hand field work as hoeing, transplanting, weeding, etc. The labor question in California is a serious problem. Japanese contract labor is perhaps the most satisfactory though some large ranchmen are trying the experiment of substituting Chinese labor.

The following is a brief synopsis of the cultural operations for the season 1907–1908:

Plowing was begun as soon as the first rains had moistened the soil sufficiently (Dec. 14–25). A double disc plow was used going to a depth of nine inches. The soil was then double disced and double harrowed. On Dec. 17th seeding was begun, using a No. 5 Planet Jr. seeder set to drill about 75 lbs. to the acre, seeding quite shallow, $\frac{1}{2}$ inch about. The rows were three feet apart. The preparation of soil and the seeding was continued as the weather (rains) and soil condition would permit. Naturally this meant many interruptions. From Jan. 18th to Feb. 11th there was more or less rainfall every day and all field operations were discontinued during that period. By Feb. 18th the seeding was completed. A careful examination of the field about seven weeks later made it only too evident that the seedlings would not be able to force their way through the soil crust and in the meantime weeds as mustard, California poppy, chickweed, bur clover, etc., began to grow very luxuriantly. In the entire area seeded not a thousand seedlings made their appearance and arrangements were made at once to retill and reseed the entire field. This was done from Feb. 19th to March 9th. In addition three canvas-covered cold frames (6 x 60 feet.) were seeded on Feb. 16th and 17th, and March 3rd, about 1.5 lbs. of foreign seed per frame being used.

As was half anticipated, based upon the complete failure of the first field seeding, the second seeding did not yield much better results. A number of seedlings made their appearance, but the prospects were so discouraging that the entire second field seeding was also abandoned,

excepting a small area of about one acre. This was cleared of weeds by hand labor, but even in this plot not one plant survived the summer drought.

About March 17th and 20th the seedlings came up nicely in the canvas-covered cold frames. By May 13th these were large enough for transplanting. About one acre was transplanted and irrigated (row or furrow method), but even with irrigation not over 25 per cent. of the seedlings survived. In addition about three acres were planted, following the procedure of tomato transplanting, that is, the seedlings were put out in rows six feet apart each way. A small hole was dug, a quart of water poured into the hole thus made and mixed with the dirt into which the seedlings were planted. Not a single plant survived. It was very evident that belladonna seedlings were far less resisting to sunshine and drought than tomato seedlings. Most of the young plants were left in the cold frames, kept free of weeds and occasionally irrigated. They made an excellent growth during the summer, most of them developing good roots.

The entire commercial experiment above outlined can be summarized as a complete failure, so complete in fact that if the writer had not had previous experience with belladonna culture he would declare it a waste of time and money to make further attempts. Writer hoped to harvest thirty tons at first; this estimate was reduced to twenty tons in March, and to five or six tons in April, and to one or two tons in May. The final harvest for the season 1907–1908 was just 30 pounds.

The reasons for the failure are as follows:

1. Unfavorable climatic conditions. The season was abnormal in every way—too chilly, rainfall deficient, persistent dry winds and very little fog.

2. The slow germination of the seed, the packing of the soil and top crust formation, the weeds and the slow growth of the young seedlings make field seeding wholly impracticable.

3. Cold frames were started too late. It was, in fact, not intended to resort to cold frames at all, as it was hoped the field seeding would prove at least partially successful.

4. To above causes must be added lack of experience, inability to secure help familiar with belladonna culture, more or less unsuitable tools and farm implements.

Based upon past experiences, the following was suggested as the best plan of procedure for the season 1908–1909:

1. Begin operations in September or early October. Seed in cold frames and begin transplanting in November.

2. Arrange cold frame seeding so that transplanting may proceed in November, December, January and March. Transplanting must be completed by the latter part of March.

3. The field must be kept free of weeds by hand labor and by cultivation.

4. There can be no gain from field seeding, even though the seeds should germinate well and the young plants should be established. Seeds require at least eight weeks to germinate. Within that time weeds grow, and must be kept down by repeated hoeings, which makes this method fully as expensive as transplanting.

5. It will no doubt be desirable, though perhaps not absolutely necessary, to crop irrigate, perhaps in June and again in July.

6. Japanese labor must be by contract. Japanese day labor is almost as expensive as white labor.

From August 18th to October 18th, 1908, sixteen cold frames (6x60 feet) were prepared and seeded to belladonna. The time required for a goodly number of germs to appear varied from six to ten weeks, and even longer. Cutworms and a species of manure worm (wireworm) killed many of the seedlings. During the winter months the young plants made very little growth. From December 9th to December 25th the weather was unusually cold for California (San Francisco Bay region), the temperature falling below 27° F. on several occasions. Some of the leaves of the young plants were killed, but the heart remained in good condition.

On November 29th and 30th, 1908, the plants from the cold frames seeded in February and March were transplanted (one acre), the soil being in excellent condition. About February 28th three acres were transplanted, taking the larger plants from the sixteen cold frames above mentioned. It soon became evident that these would not succeed in establishing themselves by the time the dry season was well set in, because of the smallness of the roots. With special care perhaps 30 per cent. would survive, but as this was not thought worth while the three acres were abandoned about March 22d, thus leaving only the 1½ acres of belladonna in the field. It was decided to leave the rest of the seedlings in the cold frames, caring for them properly, to be transplanted in November, 1910, by which time the roots will be well-grown and hardy. The sixteen cold frames now hold about 200,000 thrifty plants, enough for 20 to 25 acres of belladonna, for the season 1910.

The 1½ acres of belladonna in the field consisted of ¼ acre transplanted in May, 1908 and 1¼ acre transplanted in November, 1908. Buds began to appear in late January, 1909 and by May 15 the second-year plants were ready for the first harvest. Of the first-year plants (1¼ acre) the first crop was cut about June 10th. The yield was small because of the unfavorable season (lack of spring rain, no rain since the latter part of February). On July 13th, 355 pounds (gross) of perfectly dry and brittle belladonna leaves and stems were shipped to Johnson & Johnson. This represented the yield of the first crop from 1½ acres, and cost the firm Johnson & Johnson just $3500.00 and the writer two years of his time. At that cost it has been ascertained how to grow belladonna in San Francisco Bay Region. On July 22nd the second crop of the second year's plants was cut. The third crop will be cut in September or October. The second (and last) crop of this season of the first year's plants will also be cut in September or October. The yield of the second crop will be somewhat better than that of the first, thus making a total of about 800 lbs. of dry leaves and stems from 1½ acres.

In all cases drying was done in the open. Leaves dry quickly (3 to 4 days) but the stems require four or five weeks to become thoroughly dried.

The details of drying, packing and shipping have not yet been fully worked out, but it would appear that drying in the sun and baleing like hay, will be suitable for stems and leaves. It may be very desirable to chop the stems to hasten drying. In the future it will not be necessary to import seed as the home seed is easily produced in ample quantity, besides the home seed germinates much better and much quicker. Numerous experiments have been made with a view to hastening germination but without marked success. Macerating for two hours in concentrated sulphuric acid shortened the period by several days. Macerating in water for several days to one week or more appeared to have no very marked effect. Placing the seed in boiling hot water for several minutes appeared to hasten germination somewhat. Further tests will be made.

The following are the chief belladonna pests thus far found:

1. *Diabrotica 12 punctata*, or green ladybird, feeds on the leaves. Does considerable damage some seasons.

2. *Larvæ* of the above, commonly known as cutworms, eat the roots of seedlings. Do serious damage to seedlings in cold frames. Most active in the fall of the year.

3. *Squirrels and gophers.* These are a general agricultural pest on the Pacific Coast.

4. *Caterpillars* feed on the leaves. This pest has thus far been found only on plants grown in Golden Gate Park, San Francisco.

5. *Aphis* appeared on plants (leaves and stems) grown in Berkeley at the home of the writer.

The true brown ladybug which has been introduced into California to aid in the extermination of the various species and varieties of aphis, appears to select the large belladonna plants as its resting place. It does no harm, on the other hand it is very useful as it keeps away the aphis.

SUMMARY.

The subject of belladonna culture in the United States may be summed up as follows:

1. Belladonna can be grown successfully on the Atlantic Coast and on the Pacific Coast, and perhaps in every state of the Union.

2. In those states where the temperature drops to 10° F. and lower, the roots must be taken up and protected against freezing, and again transplanted in the spring.

3. Because of the slow germination of the seed and the initial slow growth of the seedlings, seeding must be done in hot-house frames (in states with cold winter seasons) or in cold frames (in states where the winter temperature does not fall much below 30° F.). Transplanting to be done at the proper season when roots are well grown.

4. Although a shade plant it thrives well in the open in countries having cool nights and abundant fog, with considerable atmospheric moisture. Seedlings require abundant soil moisture. When well rooted high soil moisture is not essential.

5. In the Eastern states two crops of stems and leaves can be gathered in one season. In the warm states (California) three, and perhaps four crops can be gathered in one season.

6. The alkaloidal yield apparently runs high in belladonna grown in the United States, somewhat higher in California belladonna than in belladonna grown in the Eastern States.

7. Belladonna can be grown most profitably in the warmer states for the following reasons:

(a) It is not necessary to take up the roots each year to protect them against freezing. This means an enormous saving in time and money.

(b) Growth begins about the middle of January, maturing the first crop of the season about the first of June. The second crop matures about the middle or latter part of July, and the third crop about the first of October.

(c) In California the absence of rain during the entire summer is very advantageous in drying.

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John R. Rippetoe. Some Assays of Drugs Collected from Cultivated Plants. Am. Journ. Pharm., Nov., 1907, pp. 523–524.

F. B. Kilmer. New Era Belladonna. Red Cross Notes. Series V, Nos. 1, 2, 3 and 5, 1905.

Albert Schneider. Johnson & Johnson correspondence, field notes and cultural data, photographs, etc., touching on the belladonna experiments in California. (Private collection.)

Mr. Remington asked about the yield of alkaloid, and Mr. Schneider replied that the alkaloidal yield varied in the stem and leaves from .4 up as high as .8 per cent. in round numbers, as he remembered.

The Chair said he would like to entertain a motion, despite the fact that the paper was not upon the program of this Section, to receive and refer it to the Publication Committee—that without objection it would be so ordered. And it was so understood.

Mr. Sievers, at request of the Chair, then read the paper on Cannabis Indica referred to.

AMERICAN-GROWN CANNABIS INDICA.

BY R. H. TRUE AND G. F. KLUGH.

There is a widely held opinion that American-grown Indian-hemp tops lack the characteristic physiological activity demanded by the physicians. In order to test the validity of this opinion, seeds of *Cannabis indica* were obtained by the office of Drug Plant Investigations of the Bureau of Plant Industry, from oriental sources, as well as from fresh shipments of commercial material. The hemp plants obtained were grown in part at Washington and in part at Pierce, southern Texas. Although supposed to be of like botanical origin, the plants obtained showed very differing characteristics as regards stature, form and general appearance. It was found, however, by growing these forms for a number of seasons under like con-

ditions, that these differences became less and less marked. Material for testing taken from the hemp grown both at Washington and in Texas showed in general a greener appearance than the brown, flattened tips of foreign origin, and dealers in crude drugs were inclined to demand the brown color in commercial material. The green American tips, especially soon after drying, had a sharp hempy odor lacking in the foreign article. In the hope of getting the desired color and odor, and partly cured, but still damp tips were piled up in close piles, which were weighted down to reproduce the conditions seen in bulks of cigar tobacco undergoing fermentation. To prevent too active oxidation, apparently due to oxidases present in the drug, the piles were torn down and the material aerated every day or two. As a result of this treatment, the tips took on an appearance similar to that characteristic of the imported hemp, and smelled like it.

In order to ascertain the physiological activity of the home-grown drug, extracts were prepared from the fermented and from the unfermented material from both Washington and Texas, and were compared with extracts from high-grade physiologically tested drugs. Prolonged tests were carried out on dogs, with the steady result that the home-grown hemp was found to be fully equal in efficiency to the imported article. The fermentative process seemed not to have altered the physiological properties of the drug to a noticeable degree. It is, of course, possible that in medicinal use some of the side actions of the drug might be altered by such a pronounced oxidation of the crude drug as seems to take place.

In view of these results and of the high prevailing price of the imported drug, the commercial cultivation of this drug in America seems easily possible. Owing to the great misuse to which the hemp plant is subject in the Orient in connection with the various forms of the "hasheesh" habit, it is worthy of careful consideration whether this plant should not be grown for this purpose under carefully controlled conditions. The botanical identity of Indian hemp has long been disputed among botanists, but a majority perhaps are inclined to regard the Indian hemp as belonging to the same species as the fiber hemp, *Cannabis sativa*, already largely grown in parts of this country. Houghton has found this latter plant physiologically active, and the question may be raised whether the cultivation in this country of the oriental stock would add to the danger of misuse already possible.

The gradual loss of the characteristics supposed to distinguish the Indian hemp from the fiber hemp as seen in our continued cultivations seems to point to the specific identity of the two forms, when considered botanically.

Office of Drug Plant Investigations, Bureau of Plant Industry, U. S. Department of Agriculture, August 6, 1909.

The Chair invited discussion upon the paper just read.

Mr. Schneider said he regretted that Mr. Rusby was not present. He had talked with him on this topic last evening, and he thought he remembered his saying that the home-grown hemp was not as active as the Indian-grown hemp.

Mr. Remington said he remembered very well at the Centennial Exposition in Philadelphia in 1876, he had a visit at his store from a very handsome inhabitant of Morocco in native costume. He came into his place of business and asked for Indian hemp. He happened to have ten pounds of this substance in stock, and the Moor examined it very carefully, because he was anxious to have his "hasheesh." He showed him the whole ten pounds, which had very little of the green in it. He went through it, and he asked him what he was going through it for. His reply was, "I must have this and this and this." He picked out what he wanted and said he would give a price for it which was more than the whole ten pounds cost the speaker. Mr. Remington told him he could have all the rest, and his reply was that he would not have it as a gift, that what he had selected, the greenish tops, was the only part that was good. Mr. Remington said his conclusion was, therefore, that there must be something about the green product that made it desirable—whereas the paper just read seemed to indicate that the Department was trying to get it brown.

Mr. Sievers responded to this that he thought the idea was that the market demanded the brown.

Mr. Remington did not concur in this view and thought perhaps the quality was not improved by exposure to the air.

Mr. Francis said he did not want to allow the suggestion of Mr. Schneider to go unchallenged in quoting Dr. Rusby's opinion to the effect that the American-grown hemp was considerably weaker, therapeutically, than the imported article. It may be that more or less of the material grown in America is weak. On the other hand, very conclusive experiments carried out in the laboratory of his establishment, on a large amount of material and large number of different samples, allowed the positive assertion that it was not difficult to get the native-grown article fully as active in its physical action as the foreign-grown hemp. Moreover, we can get this hemp as practically a by-product. The plant is grown in the middle Southern States. He was not entirely familiar with the process, but thought they cut the plant and stacked it up and let it stand for a time, and then cut the seed-tops off and threw them away. By the exercise of the proper care, he had not the slightest doubt that the entire demands of the United States could be supplied by the native plant, and without any difficulty whatever, even though it was not grown by our farmers for that purpose at all. He thought this was a point where we have overlooked our native resources in going abroad.

Mr. Caspari called attention to a paper read by Mr. Houghton, of

Detroit, on this very subject, and published in the Proceedings. It was along the line of Mr. Francis's statement.

The Chairman stated in connection with the cultivation of drug plants that it was worth any man's time, when in or near Washington at any time, to visit the Drug Testing Gardens at Arlington Farm.

Mr. True was in charge of the station, and was a most affable gentleman, and he was sure if any of the members would go there and make themselves known to Mr. True, it would be his pleasure to make them have a most interesting afternoon. The number of things they are doing there is really surprising. One of the most promising features under way at the present time is in connection with the opium alkaloid. They are experimenting on quite a large scale in the preparation of opium alkaloids from the poppy capsule. They are having quite a success with that, and he believed Dr. True was about ready to report results—or would report them in the future.

The Chair stated that there were a number of papers, the authors of which were not present, that he would like to present only by title, and without objection they would be referred to the publication committee, as follows:

Observations on Commercial Tinctures of Iodine. By Agnes Dunning and L. E. Sayre.

Beef, Wine and Iron. By H. Engelhardt and H. W. Jones.

Elixir of Lactated Pepsin. By W. A. Pearson.

On the Keeping Qualities of Some U. S. P. Volumetric Solutions. By A. H. Clark.

A Note on the Assay of Jalap U. S. P. By A. H. Clark.

The Assay Methods of the U. S. P. By A. R. L. Dohme and H. Engelhardt.

Identification of Fluidextracts. By H. M. Gordin.

On the Crystalline Alkaloid of Calycanthus Glaucus. By H. M. Gordin.

The Alkaloids of Menispermum Canadense—Preliminary Communication. By H. M. Gordin.

The Microscopy of Larkspur and Stavesacre. By Chas. W. Ballard.

Resin of Podophyllum. By Wilbur L. Scoville.

Mr. Francis, commenting on the paper by Mr. Scoville on resin of podophyllum last presented, said it was interesting to note the fact that the author was drawing a comparison between Podophyllum Peltatum, official in the United States Pharmacopœia, and Podophyllum Emodi, which is grown in India and marketed in England in very considerable quantities, very largely to the exclusion of the American drug. This topic was suggested to Mr. Scoville, because we are particularly interested in this subject, in view of the fact that we have found that the American manufacturers are not able to compete with the European manufacturers. It is a problem that seems to be absolutely insoluble. It is due to the

fact that the Indian drug yields a larger amount of resin, and is delivered in London cheaper than the American drug, and analysis shows a higher content of resin in the Indian than in the corresponding American drug.

The Chair stated that the next paper was one on "Potassium Chlorate," by Messrs. Dohme and Engelhardt, of Baltimore. He regretted that there was not time to read this paper, as the investigations along this line were the result of a serious experience in dealing with potassium chlorate that the firm with which these gentlemen were connected had had some years ago.

Mr. Caspari said he could, in a few words, state the main points made in this paper, which was one that he regarded as worthy of careful reading. He then abstracted the paper briefly, and pointed out that the suspected cause of the explosion of potassium chlorate was to be sought in the contaminations present in the substance produced electrolytically. The full text of the paper here follows:

THE EXAMINATION OF POTASSIUM CHLORATE.

BY A. R. L. DOHME AND H. ENGELHARDT.

In an article published some time ago, Gartenmeister * stated that mixtures of potassium chlorate, sulphur and sugar sometimes incline to spontaneous combustion and even explosions. He ascribes this action to the presence of hypochlorites or other chlorooxides. Perchlorates do not produce this effect, as they are less dangerous than potassium chlorate. Gartenmeister requires that a cold saturated solution of chlorate of potash mixed with a few drops of sulphuric acid should not give a blue color with potassium iodide starch solution within a few minutes.

Couleru † also believes that hypochlorites or other chlorooxides are the cause of explosions. He attributes the presence of these substances to insufficient purification and drying. He claims that potassium chlorate produced electrolytically by the calcium chloride process is distributed without further recrystallization. He further states that a drying of the salt at 80°–100° C. might be sufficient to drive off the water, but that a temperature of 110°–120° C. is necessary to expel these undesirable oxycompounds of chlorine.

These two articles have been answered by Carlson and Gelhaar,‡ of the Stockholms Superfosfat Fabrik Aktiebolag, a concern which apparently produces large quantities of potassium chlorate. They claim that the reaction as proposed by Gartenmeister is too rigid, and will take place with any chlorate, they having worked with a product which had been recrystallized four times and dried three times, once in an almost absolute vacuum.

The action of the oxycompounds of chlorine on potassium iodide starch solution is as follows:

* Chemiker Zeitung, 1907, No. 14.

† *Ibid.*, 1907, No. 17.

‡ *Ibid.*, 1908, No. 51 and No. 53.

1. Hypochlorites and hypochlorous acid give a blue coloration in alkaline, neutral and acid solutions. If alkali is present in excess the blue color disappears very rapidly.

2. Chlorous acid and chlorites do not give a blue color in an alkaline or neutral solution, the blue color, however, being produced as soon as the smallest amount of acid is present.

3. Chlorine peroxide acts like chlorous acid.

4. Chloric acid and chlorates do not produce at once a blue color in alkaline, neutral or acid solutions.

5. Perchloric acid and perchlorates in moderately strong solution do not color potassium iodide starch paste at all.

Carlson and Gelhaar claim that the amount of acid used by Gartenmeister is too large,* and that it decomposes the chlorate. By numerous experiments they found the following test to be correct:

Five Gm. of the chlorate in question are dissolved in 100 Cc. of cold water and mixed with one drop of potassium iodide starch paste. If a blue color is produced at once hypochlorites are present. If no color is produced add 2 Cc. of $\frac{N}{10}$ sulphuric acid. If no color is produced at once chlorites are absent also.

They further give directions for a quantitative determination of these two substances which may be of interest.

They determine the hypochlorites by adding $\frac{N}{10}$ arsenous acid to the solution of a weighed quantity of the chlorate in water and titrating the excess of arsenous acid with $\frac{N}{10}$ iodine solution. For the determination of chlorites they add to an aqueous solution containing a known amount of the potassium chlorate sufficient $\frac{N}{10}$ arsenous acid solution (previously found by experiment) to destroy the hypochlorites, then a few crystals of potassium iodide and a very small amount of sulphuric acid, titrating the iodine which may be liberated with thiosulphate solution. If on addition of more acid more iodine is separated, they titrate again, and continue this process until, on further addition of sulphuric acid, no more separation of iodine takes place. The reactions may be expressed by the formulas:

1. $2NaOCl + As_2O_3 = 2NaCl + As_2O_5$.
2. $KClO_2 + 4KI + 2H_2SO_4 = KCl + 2K_2SO_4 + 2H_2O + 4I$.

They advocate the gradual addition of the sulphuric acid, claiming that the adding of the total amount might lead to a partial decomposition of the potassium chlorate. This, however, does not agree with an experiment on which they report in a footnote. They found that by allowing 500 Cc. of $\frac{N}{10}$ potassium chlorate solution to stand with 500 Cc. $\frac{N}{10}$ sulphuric acid in presence of potassium iodide starch paste a blue color is

* Landolt (Chemiker Ztg., 1907, No. 22) holds the same view. He also claims that too strong an acid decomposes the potassium chlorate partially.

produced at once (as was to be expected, they say, considering the large excess of the acid), but that this blue color can be discharged by a very small amount of thiosulphate solution. By allowing the two solutions to stand for two weeks the decomposition of the potassium chlorate is not increased to any appreciable extent.

Carlson and Gelhaar give another process for the determination of chlorites in chlorates in presence of hypochlorites, depending on the decoloration of indigo-carmine by chlorites in acid solutions. For further information the original article should be consulted. They have examined a great number of chlorates of their own production and several samples of other manufacturers. They have never been able to find hypochlorites or chlorites. They further state that the crude chlorates never contain chlorites (owing to the greater solubility of chlorites in water), but usually hypochlorites, which, however, can easily be removed by recrystallization. A chlorate containing hypochlorites, therefore, may be found on the market, especially when, as Couleru claims, unscrupulous manufacturers sell their products without further recrystallization. But according to Carlson and Gelhaar the presence of hypochlorites could be detected by the odor just as easily as by the potassium iodide starch solution, and as most of the pharmacopœias require an odorless salt such articles could never be passed.

In his answer to the above article, Gartenmeister* states that while Carlson and Gelhaar have solved the question of determining the hypochlorites and chlorites in chlorates perfectly, they did not give a satisfactory answer to his paper in regard to the test proposed by him. He claims that they worked with impure salts, notwithstanding the repeated recrystallizations and dryings, and that 25 Cc. of a saturated solution of potassium chlorate, produced by the old process, never gives a blue color within two minutes with sulphuric acid and potassium iodide starch paste, even when ten drops of a 25 per cent. sulphuric acid are used, *i. e.*, 60 times as much as used by Carlson and Gelhaar.

As most of the chlorates at the present time are produced electrolytically, and as most do not answer this more rigid test, Gartenmeister claims that by the electrolytic process a substance is produced being in chemical constitution between chloric and chlorous acid. From the potassium salt of this hypothetic chlorooxyacid, which has not been studied as yet, active chlorooxycompounds seem to be split off, slowly in the presence of a weak acid, more rapidly by a stronger acid. To eliminate this active substance from a potassium chlorate produced electrolytically, Gartenmeister proceeds as follows:

One hundred parts of potassium chlorate are mixed with one part of water, two parts of hydrochloric acid (sp. gr. 1.19) and three parts of

* Chem. Ztg., 1908, No. 95.

alcohol, and the mixture heated to gentle boiling for one hour. The potassium chlorate is then separated in the usual way. This process is covered by letters patent (French patent 392604).

Ponndorf* recently reported on some very interesting experiments he had made with samples of potassium chlorate produced electrolytically, and with a sample obtained from Gartenmeister, which had been made by the old process. Sample No. 1 was the last-mentioned product, No. 2 and No. 4 electrolytic products of Swedish manufacture, No. 3 and No. 5 also electrolytic products made by German firms.

On applying Gartenmeister's proposed test he found that No. 1 gave a blue coloration after 2½ minutes, while the blue coloration was produced at once by the other samples, in case of No. 3 and No. 5 the color being very strong. To show whether or not the danger of spontaneous combustion is in any proportion to the intensity of the above reaction, Ponndorf made mixtures of the different samples of potassium chlorate with ammonium nitrate and rosin, in the proportion of 7 : 1 : 2, and heated these mixtures in a test-tube in an oil bath. The following observations were made:

The mixture made with potassium chlorate No. 1 decomposed with deflagration at 127°, 132°, 130° and 131° C. respectively.

The mixture made with No. 2 showed the same decomposition when heated to 134° and 134.5° C. respectively, while the mixture made with No. 4 required a heating to 128°, 145°, 133° and 138° C. respectively.

The mixture made with the potassium chlorates No. 3 and No. 5 did not deflagrate at all when heated to 172° C., and showed no decomposition, a brownish color only being produced.

As No. 3 and No. 5 give the strongest reaction for active chlorine, but do not deflagrate (when mixed in the above proportions with ammonium nitrate and rosin) at a temperature higher than that applied for the mixtures with the other chlorates, Ponndorf considers a potassium chlorate made electrolytically, and not standing Gartenmeister's reaction, in no way more dangerous than a product made by the old process, and producing a blue color but slowly when subjected to the potassium iodide starch-sulphuric acid test.

A very feasible explanation of the action of some, especially electrolytically prepared samples of potassium chlorate on potassium iodide starch paste, is given by Kloppstock.† He found that the reaction is produced by the presence of insignificant quantities of potassium bromate, with which potassium chlorate frequently is contaminated. Commercial potassium chloride usually carries traces of potassium bromide, and when such a salt is subjected to electrolysis an isomorphous mixture of potassium chlorate and traces of potassium bromate are obtained.

* Chem. Ztg., 1908, No. 95.

† Chem. Ztg., 1909, page 21.

Kloppstock succeeded by concentrating the mother-liquids of large quantities of potassium chlorate in obtaining a liquid in which the presence of potassium bromate could easily be established. He further states that he never found a sodium chlorate contaminated with the active substance, explaining this by the fact that sodium chloride very seldom contains bromides.

A serious explosion of potassium chlorate, which happened in the laboratories here some time ago, has induced us to examine a great number of samples of potassium chlorate, including the one which caused the explosion, more critically than the U. S. P. requires, especially also for hypochlorites and chlorites. All the samples, which answered perfectly the requirements of the U. S. P., did not contain these two substances, but, while answering the test proposed by Carlson and Gelhaar, they did not stand the reaction required by Gartenmeister.

We think, however, that this chlorooxycompound which Gartenmeister suspects in potassium chlorate or the potassium bromate, as claimed by Kloppstock, is present usually in such small amounts as not to render the salt dangerous, for tons of potassium chlorates have been used, and espepecially compressed in the laboratories here, without having caused the slightest damage. It would be well if the sub-committee on inorganic salts would take up the potassium chlorate question for the next Pharmacopœia, and if possible work out a test which would eliminate questionable and dangerous products.

Baltimore, June 19, 1909.

The following papers were also read by title and referred for publication:

The Condensation of Chloral with Primary Aromatic Amines. By A. S. Wheeler and S. Jordan.

Gelsemine Hydrochloride and Gelseminine. By L. E. Sayre.

The Examination of Bismuth Betanaphtholate. By W. A. Puckner and W. S. Hilpert.

Supplementary Note on Liquor Potassii Arsenitis. By A. B. Lyons.

The Chair stated that this brought the Section up to the consideration of two papers containing a large amount of statistical matter, involving extensive tables of figures, which he thought it would be very expensive to print in the Proceedings. One of these was a paper by A. B. Lyons entitled, "The New Alcohol Tables of the U. S. Bureau of Standards," and the other a paper by Frank X. Moerk, entitled, "A Practical Classification of the Quantitative Tests of the U. S. P. (8th revision)." He suggested that the two papers be simply referred to the Publication Committee, without definite instructions. In reply to a question by Mr. Whelpley, the Chair stated that the tables referred to were not copyrighted.

Thereupon, upon motion of Mr. Remington, the two papers in question were read by title, received and referred to the Committee on Publication, without instructions.

The next and final paper on the program was one by Mr. Schneider, of San Francisco, on Chinese Materia Medica, and Mr. Schneider was invited to abstract his paper, which he did, with copious notes of explanation of these foreign drugs and products.

The text of the paper here follows:

NOTES ON THE CHINESE MATERIA MEDICA OF SAN FRANCISCO.

BY ALBERT SCHNEIDER.

The materia medica of Chinese San Francisco is that of China on a smaller scale, and, as has already been explained,* the Chinese doctors are essentially herbalists, although drugs of animal and mineral origin are also used. However, the drugs derived from the vegetable kingdom so far outweigh all others that these latter might be practically ignored. Several Chinese doctors who advertise in the San Francisco dailies claim that they use over 3,000 different kinds of herbs, and more than this number are described in the Pen ts'ao or Chinese Herbal or Pharmacopœia. This most interesting Chinese classic is profusely illustrated. The illustrations, made by Chinese artists, are quite accurate as to detail, but unfortunately the scale of reduction is not given. A small herb is drawn as large as the shrub or caulescent herb. Thus far no one has attempted a translation of this work. The nearest approach to it is the Botanicon Sinicum by Dr. E. Bretschneider. This is indeed a valuable treatise, giving a digest of the more important of the Chinese works on materia medica. It must be in the hands of every one who intends to obtain information regarding the plants used in Chinese medicine. There are a number of English, French and German works on Chinese botany and several on Chinese materia medica. The purely botanical works, as a rule, fail to give the Chinese names of the plants described. The foreign works on Chinese materia medica give the Chinese names of the vegetable drugs, followed by the scientific name of the plant from which the drug is derived, in so far as that is possible. The work by Fr. Porter Smith † is perhaps the most important. Another valuable reference work is the Port Catalogue of the Chinese Customs Collection at the Austro-Hungarian Universal Exhibition, Vienna, 1873, published by order of the Inspector-General of Chinese Maritime Customs, Shanghai, 1873. Even with all of the best available works touching on the botany and materia medica of China, supplemented by information obtained from Chinese doctors and druggists of San Francisco, it was not possible to secure accurate information regarding the identity and origin of many Chinese drugs. According to Chinese authorities of San Francisco there are not over two hundred vege-

* Chinese Drugs and Medicines in San Francisco. Pacific Pharmacist, 2, 196–204, 1908.

† Dr. Fr. Porter Smith. Contribution toward the Materia Medica and Natural History of China. Shanghai, 1871.

table drugs that have marked therapeutic value or that are extensively used. The great majority (of the 3,000 and more listed) have little or no value even from the Chinese standpoint, and only an occasional use is made of them.

The drugs found in the Chinese drug stores of San Francisco may be classified as follows:

I. Drugs of Mineral Origin.

1. Rock formations, as quartz, limestone, soapstone, lime concretions, etc. Medicinal use apparently quite limited.

2. Ores containing arsenic, copper, lead, iron, etc. Not extensively used.

3. Chemicals, as salt, saltpeter, alum, iron sulphate, copper sulphate, soda, etc. These are generally quite impure, and would fall far below the U. S. P. standards. Iron and copper sulphate usually appear quite pure. Several other chemicals, resembling acetanilid physically, have come to notice, but their composition was not determined. Use rather limited.

4. Mineral powders: Rocks of various kinds reduced to a powder. Use limited.

II. Drugs of Animal Origin.

1. Bones (mostly long bones) and teeth of such animals as deer, tiger, elephant, rhinoceros and other wild animals. The bones are entire or broken.

2. Fish bones; fins of shark and of other fish; scales of fish, alligator and armadillo.

3. Horns of deer, rhinoceros and cattle. Usually sliced, rasped or reduced to a fine powder.

4. Hoofs of ruminants, hides, hair, glue.

5. Sinews (tendons) of deer and cow.

6. Cow bezoar, camel bezoar.

7. Snake skins, those shed spontaneously by certain species, and also entire skins dried and mounted on frame; lizards (spotted), always in pairs (male and female), neatly mounted and dried on bamboo frame; centipedes (single), mounted on bamboo; salted scorpions, tortoise shells and bones (plastron), etc.

8. *Mylabris cichorii*, red flies, wasps, roaches, bees, insect skins, cocoons, parasitized larvæ, etc.

9. Sea slugs (biche de mer), worms, fish bladders, etc.

10. Dung of bat and of other animals.

11. Dried urine or uric acid concretions.

III. Drugs of Vegetable Origin.

1. Crude vegetable drugs, not specially prepared. These may be subdivided as follows:

a. Botanical origin known or fairly well established. Many of this group are closely similar to or identical with drugs in American pharmacy, and include senna, star anise, anise, licorice, rhubarb, nut galls, nux vomica, wormwood, sweet flag, cloves, crocus, cassia buds, safflower, aconite, cinnamon, gentian, ginseng, mustard, etc. Some are used by the Chinese only and are not found in the American trade. as China root (Pachyma cocos), China bark, Chinese and Corean ginseng, garlic seed, Chinese mints, cinnamon chips, Chinese cardamoms, etc.

b. Botanical origin uncertain or not fully established. A goodly percentage of crude vegetable drugs belong to this sub-group.

c. Botanical origin entirely unknown.

2. Crude vegetable drugs variously treated or prepared. The treatment usually consists of boiling in water with salt, syrup, honey, ginger juice, etc., the object being to reduce toxicity, to neutralize or destroy some objectionable substance in the drug or to increase its therapeutic value. Some are evidently exposed to steam, others are roasted or charred in the fire. Prepared vegetable drugs may be subdivided like Group I, though they are by far fewer in number.

3. Gums, resins, solid extracts. These are not abundant and are mostly very impure. The botanical origin of some of these substances is very doubtful.

4. Vegetable pills. The Chinese use enormous quantities of pills. Microscopical examination showed that most of them were of vegetable origin. They may be grouped as follows:

a. Tonic and stimulating pills. These are usually very large, about the size of a large plum, and covered or enclosed by wax. Such pills are eaten after the wax is removed.

b. Aloe or laxative pills. In these the chief ingredient is aloes. They are not much larger than our laxative pills.

c. Male and female pills. These pills are about the size of an ordinary laxative pill, black in color and uncoated, many in one box (tin box for female, lead box for male). They are supposed to regulate or tone up the sex functions. Their use was not made very clear.

d. Eye pills. These are very small and put up in bottles. Used in eye troubles.

e. Camphor pills. Medium size, from Chinese standpoint, wax covered. Amount of camphor present considerable.

f. Rhubarb pills. Chief ingredient rhubarb.

g. Anti-opium pills. Medium-sized pills in ounce bottles, coated with cinnabar. These are supposed to contain gum opium or morphine, or perhaps some unknown narcotic, and are intended to cure the opium habit.

5. Tablets. These are not common. Some were reported to contain morphine.

6. Powders, simple and compound. These are not common.

7. Plasters, mounted on cloth, intended for rheumatism. The base appears to be wax and oil. The active ingredient is one or more vegetable substances not identified.

8. Pastes and ointments.

9. Tea cakes, seed cakes, rhubarb cakes.

IV. Liquid Drugs.

1. Medicinal liquors and tonics. Medicated liquors are used extensively. The alcoholic base is Chinese gin having a fairly high percentage of alcohol, 40 to 50. Certain liquid tonic medicines contain no alcohol, nor was it possible to determine the active ingredients.

2. Vegetable oils.—Mint oil, crude and refined, clove oil, oil of cinnamon. Mint oil is by far the most common, usually put up in small bottles of about one mace (57.98 grains) or one tael (1.33 oz) capacity.

The Chinese use drugs often and in large doses They appear to be especially fond of pills, particularly the large tonic variety which are eaten. The small pills are swallowed entire, from several to many (one hundred or more) at one time. As a general thing infusions are made of vegetable drugs and taken in teacupful doses. Leaves, herbs, flowers, orange and lemon peel, etc., are infused entire or broken. Barks, roots, rhizomes, tubers, woods, etc., are sliced or crushed in a mortar before infusing. The following drugs are extensively used: licorice, cinnamon bark, cinnamon chips, rhubarb, Chinese cardamoms, fu ling (*Pachyma cocos*), ginseng and ginseng substitutes, star anise, lizards, snake skins, deer horns, musk, bezoar, rhubarb, camphor, aloes, nutgalls (Chinese), prepared ginger. Many drugs are used for their supposedly tonic, stimulating and aphrodisiac properties, as fu ling, yam root, ginseng, many of the pills, certain barks, etc. Bones, teeth and horns of wild, ferocious beasts are supposed to infuse courage, sinews to give strength and endurance. The Chinese appear to be rather shy about taking powerful drugs internally, in fact only a few are used at all, as aconite, nux vomica and perhaps a few not as yet identified or known to us. The toxicity of the powerful drugs is reduced by prolonged boiling in water to which salt, ginger, honey, syrup or other substances have been added. Dr. Jow, of San Francisco, declared that aconite is used externally only and that poisonous drugs generally were not intended for internal use.

The Chinese druggists use no complicated machinery for grinding drugs, but they are very strong on slicing. All vegetable drugs capable of being sliced are subjected to that process. The slicing is done with considerable skill, and the pieces are very uniformly thin. China bark, so extensively used by Chinese women to give the hair that remarkable smoothness and gloss, comes in pieces about two feet long, three to five inches wide and as thin as newspaper. The slicing is done by hand by means of

a device resembling the cabbage-slicer of the home kitchen or the cutter which resembles the plug-tobacco cutter of the country grocery store. Drugs are also reduced by means of mortar and pestle. The smaller mortars and pestles are made of iron, although the American porcelain mortars are also used. The larger mortars, of from two to five gallons capacity, are made of stone, with a hard-wood pestle nearly six feet long with a head at either end. A pill-rolling bee which was witnessed may be described as follows: the large mortar is placed on the floor of the drug-store, the drugs consisting of herbs, leaves, roots, flowers, etc., are put into it. Two assistants manipulate the pestle, breaking and crushing the drugs. Syrup is added and the mass thoroughly mixed to the consistency of a very thick paste. The prescription counter is cleared off. The mass is placed on it, rolled out and divided into portions given out to the members of the drug-store force and some invited guests who knead and roll it into cylindrical pieces of approximately equal diameter. These are cut transversely into approximately equal pieces (length equal to the diameter) and each piece is now rolled and kneaded into a spherical mass by hand. The pill is now ready to be covered by wax (white or yellow). In the above instance the pills were of the large tonic variety, each pill weighing perhaps one ounce. Cakes, tablets and some of the smaller pills, are formed in moulds. Hand work however is the rule. It is perhaps evident from the above that the hand-made pills are lacking in uniformity of size, but that seems to worry neither doctor nor patient. To assist in powdering, some drugs are re-dried, and to assist in the slicing the drugs are softened by steaming or moistening for a time.

Prescription filling is even more crude than pill making. The assistant druggist receives the prescription from the customer or patient, reads it and at once proceeds to get the balance. A square piece of wrapping paper is placed on the counter, the ingredients called for are weighed on the small hand-balance (ivory yard and brass pan). It would appear that the weighing is essentially guess-work, slightly assisted by the manipulation of the balance which is certainly a very crude device. The several drugs are placed separately on the piece of paper. Why they are not mixed is not explained. The probabilities are that this method is practiced to save extra wrapping paper, as the Chinese are the most economical race on the face of the earth, having diligently and enforcedly practiced this social virtue for many centuries. Absolutely nothing is wasted by the Chinese. For example the disposal of garbage in Chinatown is reduced to the greatest simplicity by the fact that there is little or no garbage. The Chinese are good cooks and hearty eaters, but there is no waste. This economy is also noticeable in their use of drugs. Many are twice and more infused before they are finally rejected as inert. In the case of the orange, for example, all parts are used, the juice, the oil, the rind, the outer pulp, the inner pulp and the seed. In the case of vegetable drugs

generally, the roots, rootlets, stems, bark, branches, leaves, flowers, seeds and fruits of the same plant are used in so far as that is possible. The skins of ginger, the peelings of China root (fu ling, *Pachyma cocos*), the trimmings of licorice, exhausted cloves, exhausted tea, extra pickings, sweepings, etc., all are used. This sense of economy, if not dishonesty, also prompts the use of many substitutes,so forcibly illustrated in the case of ginseng.

As already explained * the Chinese use of drugs is wholly unscientific, although in some instances a rationality is displayed which is equal to the best drug empiricism of our Western schools. There is but little doubt that many of the Chinese drugs possess decided therapeutic value, although only a few of them appear to have very active properties. It is in fact this use of comparatively harmless drugs which is responsible for the large dosage generally employed.

Until about eight years ago China has made but little progress. The practices of the Chinese herbalists of to-day are not markedly different from those of two and three thousand years ago. The western influence is however beginning to be felt, and not a few of the younger Chinese doctors have a fair knowledge of physiology, anatomy and therapeutics.

As far as Chinese medical botany is concerned it is really surprising how little accurate information has been accumulated since the time of the legendary Emperor Huang ti (B. C. 27th century). The greatest confusion pertains to the plant descriptions of ancient as well as modern Chinese writers. Western botanists have had the greatest difficulties in getting facts. The most indefinite and loosely-applied common plant names have been used for centuries. The same name may be applied to five or six entirely distinct plants, and the same plant may have five or six entirely different names. There is no clear differential terminology for seeds and fruits, herbs and grasses, leaves and herbs, stem and trunk, etc. Everything is annoyingly vague and muddled. Insignificant details are repeated again and again while important facts are entirely omitted. It would certainly be a waste of time and energy for Western botanists to master the Chinese language in order that they might better comprehend the existing chaos in the Chinese materia medica. The work thus far done should suffice until such time when native Chinese scholars with western education may clear matters up.

The writer is now engaged upon the study (macroscopical and microscopical) of the more important Chinese drugs of San Francisco. One hundred and thirty-six samples were selected from a Chinese drug-store with the help of Dr. Doong Tarn Jow and Man Q. Fong; others were taken from Chinese drug shipments presented for entry at the port of San

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* *Loc. cit.*

Francisco. It is hoped that the effort will add to our knowledge of Chinese drugs and perhaps enrich our own materia medica by the addition of several or more really valuable drugs.

California College of Pharmacy,
San Francisco, California.

The Chair invited discussion upon the paper just read.

Mr. Whelpley led off in the discussion, and told of his experiences in "Chinatown," San Francisco, twenty years ago. He related the instance of a visit made with a number of pharmaceutical friends at that time to a Chinese drug store, and told of how surprised he and his party were when they were greeted in excellent English by the Chinese gentleman in charge with "Good morning! What can I do for you?" He said Mr. DeWoody of Arkansas was equal to the occasion, and informed him that they were a lot of strangers in the city seeing the sights. The Chinese gentleman still further surprised them by asking if they were not pharmacists and in attendance upon the meeting of the American Pharmaceutical Association. This broke the ice, and they became better acquainted, and they found that he had been educated in Europe, and had lived in England for some time, and knew more about the western part of this country than they did. He told them a great deal about Chinese pharmacy, showed the specimen of Chinese pills, and explained as Mr. Schneider had done, that these large pills were not to be swallowed whole, but were to be dissolved and drunk as a liquid, or chewed up and eaten. One thing that interested him was a sample like a small gourd, that was shown him, which the Chinese gentleman said was used for consumption; and the reason the Chinese physician prescribes that for consumption was, because it grew only in the most beautiful valley in China, and for that reason it had a special therapeutic value in the treatment of such a dread disease as tuberculosis.

Mr. Asher said Mr. Schneider had brought out one point that reminded him of a lecture at his school a few weeks before delivered by a gentleman connected with the Louisiana Experiment Station, giving an account of his travels in China and Japan. During the course of his remarks the gentleman had pointed out that the spirit of saving was very pronounced with the Japanese, and that they even went so far as to save fecal matter, which was sold by weight and used for fertilizing purposes, and he made the statement that the fecal matter of foreigners brought a higher price than that of the Japanese.

Mr. Beal said he would just like to suggest to Mr. Schneider that, in view of the possible adoption of the American Homeopathic Pharmacopœia as one of the standards of the Foods and Drugs Act, this study of Chinese drugs would be found quite useful. He gave some illustrations of nauseous and unscientific substances contained in the homeopathic work, and said he was very much struck with the resemblance between the homeopathic Materia Medica and that of the Chinese.

Mr. Whelpley also added a few words along this line, and told of some of the malodorous and repellant substances sent out from the homeopathic laboratory, at St. Louis.

These illustrations reminded Mr. Schneider of still others of the Chinese practices, which seemed quite rational, doubtless, from their point of view. For instance, in some cases of poisoning they give goat's-blood as a remedy, the idea being that the goat feeds upon any and everything without being injured, and there must be something in his blood which will neutralize these poisons: "Used as a sort of antitoxin, as it were," said Mr. Schneider.

Mr. Caspari told the members that they should not miss the opportunity to visit a Chinese drug store, and also a Chinese restaurant, while on the Pacific Coast. He had had most delightful experience of this sort in San Francisco recently, and he was sure they would enjoy it.

The Acting Chairman stated that this brought the work of the Section to the end of the program, but stated that he would like very much, before adjourning, to entertain a motion to extend a vote of thanks to the Chairman, Mr. Charles E. Vanderkleed, of Philadelphia. He said he had prepared the program for three successive years, and this was the only time that he was to act as Chairman, and was unfortunately prevented from doing so. He thought he deserved a vote of thanks for the excellent work he had done.

Mr. Caspari said he would like to make that motion, and let it be expressed in a forcible way. He said Mr. Vanderkleed had done very valuable work for the Section during the past three years, and it was largely through his efforts during that time that the work of the Section had been made so successful.

Mr. Hallberg said he would like to second this motion, which was then carried by a unanimous rising vote.

There being no further business before the Section, it adjourned *sine die*.

Papers read by title:

THE EXAMINATION OF BISMUTH BETANAPHTHOLATE.

BY W. A. PUCKNER AND W. S. HILPERT.

One of the phases of the work of the Council on Pharmacy and Chemistry of the American Medical Association is the investigation of unofficial preparations and the preparation of standards for such as are considered of sufficient therapeutic value. In connection with this work bismuth betanaphtholate was investigated with the idea in view of comparing the various brands on the market and to establish a suitable standard.

On searching the literature it was found that several formulas were given for bismuth betanaphtholate, although the methods of preparation vary

only slightly. The general method of preparation of bismuth betanaphtholate is the reaction between sodium naphtholate and bismuth nitrate, under conditions which differ but slightly. The reaction product is then collected and purified by various methods. The formulas given for bismuth betanaphtholate are $C_{10}H_7O(BiO)$ (Schmidt's Pharm. Chemie), $Bi_2O_2(OH)C_{10}H_7O$ (National Dispensatory, Merck's Index, British Codex, Chemische Fabrik von Heyden, Hager), and $Bi(C_{10}H_7O)_3.3H_2O$ is found in the U. S. Dispensatory showing a marked variation.

In view of the non-agreement of the published formulas, and because of the well-known variability of bismuth compounds, it was decided to determine the composition of bismuth betanaphtholate as found on the market, and as the analysis of a product is important in the control of its manufacture and in the establishment of standards, the methods employed in this investigation are here presented.

Bismuth betanaphtholate, when treated with dilute acids, is decomposed into its organic and inorganic constituents, and these, by following proper procedures, may be quantitatively separated. It is with the details of these methods that this paper will deal. The analysis may best be considered under two divisions, *i. e.*, (1) Bismuth Estimations, (2) Naphthol Estimations. From the nature of the product the presence of a certain amount of uncombined naphthol is to be expected. Since the therapeutic effect of uncombined, or free, naphthol is quite different from the effect of naphthol combined as bismuth salt, the naphthol estimation should include the determination of free as well as of combined naphthol.

THE ESTIMATION OF BISMUTH IN BISMUTH BETANAPHTHOLATE.

Preliminary Experiments.—It is commonly suggested that the bismuth content of organic salts of bismuth be determined by igniting such compounds and weighing the bismuth oxide obtained; or else, to ignite them, dissolve the residue in nitric acid, and change the bismuth nitrate so obtained to bismuth oxide by heating. The latter method is prescribed for bismuth subgallate U. S. P., bismuth subsalicylate U. S. P., bismuth citrate U. S. P., and bismuth and ammonium citrate U. S. P. The method is recommended for bismuth betanaphtholate, in "Prüfungsvorschriften für die pharmazeutischen Special-Präparate," by E. Merck, Darmstadt, and by C. Gaebler (Pharm. Ztg., vol. 45, p. 567; Chem. Centralbl. 1900, II, 597), who found that the ignition to oxides was satisfactory. A considerable number of experiments were made to estimate the bismuth in bismuth betanaphtholate by ignition to oxide, but the results, in spite of precautions, were unsatisfactory. The following experiment is typical: 1.734 Gm. bismuth betanaphtholate was heated very gradually in a porcelain crucible, first with a ring burner, then subjected to the full heat of a bunsen flame, but avoiding fusion of the bismuth oxide formed. The residue weighed 1.3239 Gm., corresponding to 68.45 per cent. bismuth

(Bi). The crucible was now heated until the contents melted. The residue now weighed 1.3297 Gm., or 68.76 per cent. Again heated and fusion continued for one minute, the residue weighed 1.3337 Gm., or 68.96 per cent. bismuth. Again heated during five minutes, the residue weighed 1.3343 Gm., or 69.00 per cent. The bismuth oxide was now dissolved in 2 Cc. concentrated nitric acid and 2 Cc. water, the solution filtered quantitatively to a dish, and the filtrate evaporated and ignited. The bismuth oxide obtained weighed 1.3420 Gm., corresponding to 69.11 per cent. bismuth. A series of experiments, carried out as above, gave results for the specimen in hand ranging from 69.11 to 69.71 per cent. bismuth (Bi). Since the estimation by direct ignition appeared unsatisfactory, the following experimental methods were tried:

Method A.—1 to 2 Gm. bismuth betanaphtholate was weighed into a porcelain crucible and mixed with twice its weight of dried sodium carbonate by stirring with a glass rod. Very gentle heat was applied to the covered crucible as long as vapors were evolved, the heat being insufficient to fuse the bismuth oxide. The contents of the dish were transferred to a large beaker and 10 Cc. of water poured into the beaker. The crucible was now placed in the beaker and 10 Cc. strong nitric acid poured into the crucible. When the bismuth oxide remaining in the crucible was dissolved, the beaker covered with a glass was inclined so that the nitric acid from the crucible gradually came in contact with the contents of the beaker. When the reaction was complete, the liquid was filtered through cotton into a beaker and the transfer completed, first with two portions, each containing dilute nitric acid, 2 Cc., and water 8 Cc., and finally with pure water until the entire filtrate measured about 100 Cc. To the filtrate ammonia was added until a slight permanent precipitate was produced, and then an excess of ammonium carbonate T. S. The mixture was heated on a water bath for one hour or more, the supernatant liquid decanted to a tared porcelain Gooch crucible, the precipitate washed twice with hot water containing a little ammonium carbonate and, finally, with hot water. The crucible containing the precipitate was dried, and then heated in a large nickel crucible, the heat being regulated so that the bismuth oxide did not fuse. The weight of bismuth oxide found was calculated to bismuth by multiplication with the factor 0.89676 (Bi_2O_3 461.44 : 2Bi 413.8). The following results were obtained:

Specimen 1: 70.71, 70.73, 70.72, 70.62; average, 70.69 per cent. bismuth (Bi).

Specimen 2: 68.29, 67.74, 68.16; average, 68.06 per cent. bismuth (Bi).

Specimen 3: 68.45, 68.76; average, 66.60 per cent. bismuth (Bi).

Specimen 4: 69.29, 69.10; average, 69.20 per cent. bismuth (Bi).

Specimen 5: 74.69, 74.74; average, 74.72 per cent. bismuth (Bi).

Specimen 6: 74.60, 74.71; average, 74.66 per cent. bismuth (Bi).

Method B.—1 to 2 Gm. substance was shaken in a separator with 25 Cc. ether and 25 Cc. dilute nitric acid, U. S. P., during one-half hour. The acid was drawn into a second separator containing 15 Cc. ether, shaken thoroughly, and after separation drawn through a pledget of cotton to a beaker. The contents of the first separator were then shaken successively with two portions of 10 Cc. each of dilute nitric acid and with two portions 10 Cc. each of water, each portion being drawn into the second separator and, after agitation and separation, through cotton into the beaker. To the liquid in the beaker ammonia water was added until turbidity ensued, and then an excess of ammonium carbonate test-solution was gradually added, and the determination completed as in method A. The following results were obtained:

Specimen 1: 70.53, 70.64, 70.32; average, 70.49 per cent. bismuth (Bi).

Specimen 2: 67.71, 67.78; average, 67.74 per cent. bismuth (Bi).

Specimen 3: 66.57 per cent. bismuth (Bi).

Method C.—The substance was decomposed and the bismuth solution obtained as described in Method B. To the bismuth solution was added 100 Cc. water, the liquid heated to boiling, ammonia water added until it became turbid, sufficient nitric acid to just clear up the turbidity, and then a large excess *—50 Cc. of 10 per cent.—ammonium phosphate solution † added to the boiling liquid. The precipitate was allowed to subside and the clear liquid decanted to a porcelain Gooch crucible. The precipitate was washed with hot water by decantation, finally transferred to the crucible, and washed thoroughly with hot water. The crucible was dried, placed in a nickel crucible and exposed to the full heat of a Bunsen flame until the weight became constant. The weight of bismuth phosphate obtained was multiplied by the factor 0.68694, to find the weight of bismuth. ($BiPO_4$ 301.19: Bi 206.9.) The following results were obtained:

Specimen 1: 69.82, 69.98, 70.76, 70.65; average, 70.30 per cent. bismuth (Bi).

Specimen 2: 67.53, 67.60; average, 67.57 per cent. bismuth (Bi).

Method D.—1 to 2 Gm. substance was shaken in a separator with 25 Cc. chloroform and 25 Cc. hydrochloric acid, U. S. P., during one hour; 50 Cc. water was then added and the mixture shaken thoroughly. After separation, the chloroform was drawn through a 7 Gm. tared filter into a tared beaker. The liquid in the separator was extracted with three or more portions of 10 Cc. chloroform, the chloroform being drawn

* This large excess of ammonium phosphate is necessary to overcome the initial acidity of the solution. The ammonium phosphate acts in forming the less dissociated phosphoric acid and brings about precipitation of the bismuth so that, in the clear filtrate after addition of ammonia water, ammonium sulphide produces no coloration.

† L. Moser, Z. anal. Chem. 45, p. 19 (1906); A. Stachler and W. Shargenberg, Ber. d. d. chem. Ges. 38, p. 3862 (1905); A. Stachler, Chem. Ztg. 31, p. 615 (1907).

through the filter. Finally, the stem of the separator, the filter and the funnel were washed with small portions of chloroform. The chloroform was allowed to evaporate spontaneously and the residue in the beaker brought to constant weight over sulphuric acid. Its weight was taken to indicate the amount of naphthol contained in the substance. Next, the bismuth solution remaining in the separator was drawn through the same filter into a large beaker, and the separator and filter washed thoroughly, first with water containing hydrochloric acid, finally with water until 150 to 200 Cc. filtrate was obtained. The filter and its contents were dried to constant weight at 95° to 100° C., and the increase recorded as insoluble matter. The bismuth solution contained in the beaker was heated to boiling, ammonia water added until the liquid became turbid, sufficient hydrochloric acid to clear up the turbidity, and then a large excess (50 Cc. of 10 per cent. ammonium phosphate solution was added to the boiling liquid. The estimation was then completed as described for Method C. The following results were obtained:

Specimen 1: 70.17, 71.18; average, 70.67 per cent. bismuth (Bi).
Specimen 2: 68.68, 68.63; average, 68.65 per cent. bismuth (Bi).
Specimen 3: 66.97, 67.27; average, 67.12 per cent. bismuth (Bi).
Specimen 4: 69.61, 69.67; average, 69.64 per cent. bismuth (Bi).
Specimen 5: 75.36, 75.34; average, 75.30 per cent. bismuth (Bi).
Specimen 6: 75.07.

This method is easily carried out, requiring no great amount of practice in successfully applying it, as is evidenced by the uniformity of the results. The bismuth phosphate separates well, permitting rapid filtration and washing. Its use is especially advantageous in the examination of bismuth betanaphtholate, since it permits of the simultaneous naphthol estimation as well as the determination of certain insoluble substances. It is an especially useful method where chlorides are present, the latter having no influence on the results as they have in most other methods. Thus, while the precipitation of bismuth as the basic carbonate necessitates the preliminary precipitation from an acid solution as sulphide, this extra manipulation is avoided by following Method D as described above. As a check on the estimation of bismuth by method "D" in a specimen of bismuth betanaphthol containing chlorides, the substance was decomposed by heating with sodium carbonate and the resulting mixture dissolved in hydrochloric acid, then nearly neutralized with ammonia water and saturated with hydrogen sulphide, diluted with water and again saturated with hydrogen sulphide, and the precipitate filtered and washed; the filtrate was made alkaline, the trace of bismuth still in the filtrate recovered, and then added to the main portion. The total quantity of bismuth sulphide was dissolved in nitric acid and precipitated as the carbonate as in method "A." By this method specimen No. 8 yielded bismuth oxide equivalent to (1) 53.12 per cent. bismuth and (2) 53.90 per cent. bis-

muth; while by method "D" (1) 56.46 per cent. and (2) 56.48 per cent. bismuth was found. This discrepancy shows the difficulty of estimating bismuth by precipitation as the basic carbonate when chlorides are present.

In view of the above, it was decided to adopt method "D" as a routine method for the determination of bismuth in betanaphthol. As a means of comparing the results by this method with results yielded by other methods, the several results obtained are given below in tabulated form:

Specimen.	Method.	Bismuth Percentage.	Average.
1	A	70.71; 70.73; 70.72; 70.62	70.66
	B	70.53; 70.64; 70.32	70.49
	C	69.82; 69.98; 70.76; 70.65	70.60
	D	70.17; 71.18	70.67
2	A	68.29; 67.74; 69.16	68.08
	B	67.71; 67.60	67.74
	C	67.53; 67.60	67.56
	D	68.68; 68.36	68.52
3	A	66.45; 66.76	66.60
	B	66.57	66.57
	D	66.97; 67.27	67.12
4	A	69.29; 69.10	69.20
	D	69.61; 69.67	69.64
5	A	74.69; 74.74	74.72
	D	75.36; 75.24	75.30
6	A	74.60; 74.71	74.65
	D	75.07	75.07
7	A	68.50; 68.45	68.47
	D	69.08	69.08
8	A	56.20; 55.62; 55.68	55.83
	D	56.96; 56.46; 56.48	56.63
9	D	61.05	61.05
10	A	60.35	60.35
	D	60.89	60.89

"Total Naphthol" Estimations.

In Method D of the bismuth estimations, naphthol was separated from bismuth by decomposing the bismuth betanaphtholate with hydrochloric acid and extracting with chloroform, and since the method removed the naphthol quantitatively, it was tried as a means of estimating the total naphthol in bismuth betanaphtholate. Experiments were first made to determine the feasibility of recovering betanaphthol from solutions con-

taining much hydrochloric acid by extracting with chloroform. The following are given as typical experiments and demonstrate that betanaphthol can be extracted quantitatively by chloroform:

0.2891 Gm. Merck's betanaphthol was placed in a separator with 25 Cc. concentrated hydrochloric acid and 50 Cc. water and the mixture shaken during two hours. The chloroform solution was then drawn off through a small filter to a tared dish and the extraction repeated with 30 Cc. chloroform in 10 Cc. portions. The filter was then washed and the chloroform allowed to evaporate spontaneously and dried to constant weight over sulphuric acid. The weight of the recovered betanaphthol was 0.2892 Gm. In a second estimation 0.5199 Gm. betanaphthol was recovered from 0.5211 Gm. These results demonstrated the accuracy of the extraction method and accordingly it was used in the naphthol estimations.

The same experiments carried out with ether in place of chloroform gave the following results: 0.3127 Gm. betanaphthol was placed in a separator and shaken with 10 Cc. concentrated hydrochloric acid and 35 Cc. ether during one-half hour and then extracted with two more portions of 20 Cc. each of ether. The ether extractions were quantitatively transferred through a pledget of cotton, to a dish, allowed to evaporate spontaneously and the residue dried over sulphuric acid. The residue weighed after drying one day 0.3431 Gm., after four days 0.3364 Gm.; after six days 0.3320 Gm., then after drying one day in a Hempel vacuum desiccator the residue weighed 0.3294 Gm. and after one day longer 0.3277 Gm. In a second estimation 0.1477 Gm. betanaphthol when extracted with ether, the solution allowed to evaporate and the residue dried over sulphuric acid to constant weight yielded a residue weighing 0.1215 Gm. These results indicate that when ether is used it is difficult to bring the residue to constant weight and that the results are high, and hence the chloroform method was adopted.

In the application of this method as a means of estimating total naphthol in bismuth betanaphtholate the chloroform solution obtained as described under bismuth estimations Method D was allowed to evaporate spontaneously, and the residue dried over sulphuric acid to constant weight. In the course of the naphthol estimations some ether extractions were made and found to compare favorably with the chloroform extractions. In view of the preliminary experiments on the ether extraction of betanaphthol it would be expected that the results would be high, but evidently the high results, due probably to enclosed acid or water carried over by the ether, were counter-balanced by the imperfect extraction by the ether. Thus Specimen 6 when treated according to the method detailed above yielded 15.73 per cent. naphthol when chloroform was used as the solvent and 15.40 when ether was used. Specimen 7 yielded 21.89

per cent. with chloroform and 21.11 and 20.76 per cent. when ether was used, showing a fairly good agreement in the two methods.

It will be understood of course that in this method correct results will be obtained only if naphthol is the only chloroform-soluble substance present. If the product contains other chloroform-soluble constituents as for instance oxidation or nitration products of naphthol, such as may be expected to form in the manufacture of bismuth betanaphtholate, they will be recorded as betanaphthol. In agreement with this it was observed that the residues which have been designated as "naphthol" did not have the melting point or crystalline appearance of betanaphthol, yet they generally responded to identity tests for betanaphthol, demonstrating the presence of the latter. Thus 0.05 Gm. of so-called naphthol, was shaken with 50 Cc. water for some time. The solution filtered and treated with ferric chloride became green in color and later yielded a white flocculent precipitate which turned brown on warming. In a few cases the negative results were obtained. These facts indicate that in some specimens betanaphthol was present with impurities or decomposition products and in other specimens betanaphthol had been almost completely decomposed, or changed beyond recognition. The figures, then, which are given as percentage of betanaphthol may be taken as indicating the upper limit of the naphthol content rather than the content of pure betanaphthol.

The chloroform method of extracting was finally adopted as the best method for the estimation of the "naphthol." The accuracy of the chloroform extractions, as demonstrated in the preliminary experiments in pure betanaphthol, above, should commend this method. But besides being accurate it is convenient because in the estimation of bismuth, chloroform is used to separate the organic matter from the bismuth, and so allows of two estimations on the same specimen, saving time and much extra manipulation.

As is often the case in evaporating ether solutions spontaneously, the solid residue has a tendency to creep over the edges of the dish, but with the use of chloroform this annoyance is done away with and adds to the simplicity and ease of manipulation.

The results in the following table were obtained by the use of chloroform except where noted:

Specimen.	"Naphthol" Percentage.
1	16.64; 16.83 (average, 16.73).
2	21.94; 21.93; 22.17 (average, 22.02).
3	10.55; 10.59 (average, 10.57).
4	20.90; 21.05 (average, 20.97).
5	15.51; 15.66 (average, 15.58).
6	15.73 (15.4 = by ether).
7	21.89 (21.11; 20.76 = by ether).
8	7.05; 6.73; 6.91 (average, 6.89), by ether, 5.93.
9	21.58.
10	21.69; 21.89.

"FREE NAPHTHOL."

"Uncombined" or "free naphthol" was determined by directly extracting bismuth betanaphtholate with ether. The bismuth betanaphtholate was weighed in a small asbestos-plugged percolating tube, 5 Cc. ether added, mixed by means of a glass rod, and allowed to percolate slowly into a tared dish. When the liquid ceased to drop, a further portion of 5 Cc. ether was poured into the percolator and also allowed to percolate into the tared dish. The stem of the percolator was washed with a little ether and the combined washings and percolates allowed to evaporate spontaneously, and the residue brought to constant weight over sulphuric acid. Chloroform, instead of ether, was also used, and in most cases the results agreed with those obtained by the ether method. The following examples illustrate the concordance between the results obtained with ether and those obtained with chloroform:

2.0078 Gm. bismuth betanaphtholate treated with ether as above described yielded free naphthol weighing 0.0066 Gm., or 0.33 per cent. of the material used. A sample, 2.2151 Gm. of the same specimen, percolated with chloroform, yielded 0.0054 Gm. residue, indicating the presence of 0.24 per cent. free naphthol, and agreeing closely with the result obtained by ether extraction.

The following table gives further results of "free naphthol" estimations on different specimens of bismuth betanaphtholate:

SPECIMEN.	"FREE" OR "UNCOMBINED NAPHTHOL."
6	0.24 (by ether, 0.33).
7	18.46 (by ether, 0.33).
8	4.89 (by ether, 4.46).
11	0.29; 0.52.

It will be noticed that in every case but one the results obtained by ether extraction agree with those obtained by chloroform extraction. Experiments having shown that the chloroform-soluble substance contained bismuth in some cases, its composition was examined as follows:

The bismuth betanaphtholate was percolated with chloroform, and the chloroformic percolate was repeatedly shaken with several portions of dilute hydrochloric acid. The acid extracted bismuth from the organic material, which latter was estimated by allowing the chloroform solution to evaporate spontaneously and drying the residue over sulphuric acid. The bismuth in solution was precipitated as sulphide, and finally estimated by precipitation as the carbonate and weighed as the oxide, as described under bismuth methods. By using this method 2.0081 Gm. bismuth betanaphtholate yielded 0.1522 Gm. bismuth trioxide, equivalent to 6.79 per cent. bismuth, and 11.78 per cent. organic material; and 2.1117 Gm. of the same specimen yielded 0.1901 Gm. bismuth trioxide, equivalent to 6.18 per cent. bismuth, and 11.37 per cent. organic material; 2.1704 Gm.

material yielded 0.2041 bismuth trioxide, equivalent to 6.45 per cent. bismuth, and 11.29 per cent. organic material; and 1.9361 Gm. of the substance yielded 0.1397 Gm. bismuth trioxide, equivalent to 6.47 per cent. bismuth, and 10.93 per cent. organic material.

The results of these experiments show that the chloroform-soluble constituent of the specimen examined consisted, at least largely, of an organic compound of bismuth. This compound apparently was not bismuth betanaphtholate, since other experiments have shown this to be insoluble in chloroform. That the matter extracted by chloroform was not a naphthol compound is further indicated by the fact that the "total naphthol" obtained from this specimen did not respond to tests for naphthol (see estimation of total naphthol).

The results obtained by extraction with ether will give a measure of the "free naphthol," and hence ether should be used to determine "free naphthol." But when it is desired to estimate not only free naphthol but other impurities as well, chloroform deserved preference over ether.

In order to obtain an idea of the composition of bismuth betanaphtholate as found on the American market, three specimens may be selected as being typical and their compositions, as obtained by the methods of analysis described above, be compared: Specimen 5 contained 75.30 per cent. bismuth; 15.56 per cent. "total naphthol" and 0.19 per cent. "free naphthol." Specimen 7 contained 69.08 per cent. bismuth, 21.50 per cent. "total naphthol," and 18.46 per cent. "free naphthol." Specimen 12 contained 68.21 per cent. bismuth, 24.05 per cent. "total naphthol," and 0.30 per cent. "free naphthol."

A comparison of the composition of the three specimens given above shows that the products offered as bismuth betanaphtholate differ widely. While the bismuth content varies from 68.21 to 75.30 per cent., showing a difference which, in view of the variability of bismuth compounds in general, show a variation which might be considered permissible. But as regards the "naphthol" content, which is the essential constituent of the compound, altogether unpermissible variation exists, both as to the amount of "free" and "combined naphthol" and the amount of material other than naphthol. If our conclusions in regard to the composition of specimen 7 are correct, *i. e.*, that the substance soluble in chloroform is a bismuth compound of a substance other than naphthol, this product does not deserve to be termed bismuth betanaphtholate. The result of this examination would seem to sufficiently indicate the need for the establishment of a standard for bismuth betanaphtholate.

OBSERVATIONS ON COMMERCIAL TINCTURES OF IODINE.

BY AGNES DUNNING AND L. E. SAYRE.

Since the enactment of the Food and Drug Law some attention has been given to the examination of preparations such as the retail druggist is

likely to make for himself. Among such preparations there have been sent to the drug laboratory by the inspectors tinctures of iodine taken from different parts of the State of Kansas. On examination of these it was rather surprising to find great variation of strength. A few were stronger than the official, but most of them that did not conform to the U. S. P. standard were below—some far below—that standard. It was claimed that these latter had lost iodine by evaporation through the stopper.

In the Bulletin of the Board of Health it has been shown that out of 130 samples of tinctures of iodine examined, 21 per cent. were either 100 per cent. or over of the official standard, 10 per cent. were between 90 and 100 per cent., 18 were between 80 and 90 per cent., 15 were between 70 and 80 per cent., 12 were between 60 and 70 per cent., 11 were between 40 and 50 per cent., and 9 were between 30 and 40 per cent. Many samples contained no potassium iodide. To find such variability in a preparation so easily made is rather surprising to say the least. The results of the analysis were complained of by some on the ground that the samples had been collected in cork-stoppered bottles, which it was stated decompose the iodine. It should be stated in this connection that wherever the tincture was of the official composition, that is, contained the potassium iodide, the cork was comparatively unaffected, but where this salt was not present the cork was slightly attacked. Since the question of the advisability of using cork-stoppered bottles for collecting samples has been raised, it seems safe to say that if the preparation is of the official composition (if it contain potassium iodide), the objection does not hold good. The fact is, one can tell immediately when the sample is of official composition, and when it is not, by the appearance of the cork stopper from the bottle containing the sample. If it is attacked it contains no potassium iodide.

To study this corrosive action of the preparation on cork some 130 samples of these tinctures, as they came to the laboratory, were kept for nine months in corked bottles. It was found that the concentration of iodine was progressive, and so was the cork disintegration. In some cases the cork would be entirely destroyed; often it was found scarcely adhering to the lip of the bottle; later it would drop into the liquid, and finally become entirely disintegrated and suspended in the liquid. In those samples in which potassium iodide was present the corks were not entirely unaffected, but the difference in corrosive action was very marked. Examination of the deteriorated tinctures showed the presence of ferrous iodide.

It may be well to state in passing that some parallel experiments with rubber stoppers were made. The rubber showed marked changes. Some parts of the rubber were hard and vitrified. In the cavity formed were layers of rubber in the form of rolls produced by a constricting action.

Beyond the vitrified parts the rubber was of soft consistence. To study the effect of time on tinctures of iodine bottled with cork stoppers, numerous samples were stored in a cupboard near the ceiling of the laboratory where the temperature often ranged from 25° to 28° C. The effect of time unmistakably indicated that whether potassium iodide were present or not there was a tendency toward a concentration of iodine content. In some cases where the cork was badly affected, and pieces fallen into the solution, there was some diminution of strength. The old tinctures in which there were present the cellulose iodide (?), the end reaction with sodium thiosulphate was yellowish, but with starch solution the end point was sharp and easily obtained.

To determine the character of the deterioration of the official tincture samples of the U. S. P. tincture were distributed in various stoppered bottles. These were subjected to conditions such as the preparation is apt to meet in the hands of the pharmacist.

It would prolong this paper unduly to give in detail the results obtained from the numerous samples thus subjected; suffice it to say that these experiments confirmed the former observations, namely, that the tendency is toward an increase in the iodine strength. Titration of the samples after a month's exposure showed that there was a concentration of the iodine content. But for ten days there was practically no concentration.

These few experiments seem to indicate that the official tincture of iodine can be safely transported to the laboratory for analysis, and the legality of such analysis should not be questioned, because of the cork stopper. It further shows that if the sample on analysis indicates a deficiency in strength, this cannot be due to the age of the sample nor to the cork-stoppered container. The objection to the glass-stoppered container is too well known, for a preparation of this kind, to need description. In Kansas these containers were tried, and they proved very unsatisfactory. It is almost impossible to get a small glass-stoppered bottle, the stopper of which is sufficiently well ground, to transport in it this volatile preparation

BEEF, WINE AND IRON.

BY H. ENGELHARDT AND H. W. JONES.

On several occasions it has been claimed that the process of the N. F. for making Beef, Wine and Iron is faulty, and that a great loss of nitrogen and especially of iron occurs in the filtering directed by this method. In one case it was reported that the iron was reduced to one-tenth of the required amount. The loss of nitrogen, while not so great, was considerable enough, however, to bring the preparation below the standard. It has been recommended also that the tincture of citro-chloride of iron might preferably be substituted by iron-ammonium citrate as the latter according to some investigators is not so prone to precipitation by the proteids of the beef extract.

That such great losses should occur, even when the materials used were of the best and the greatest care was exercised in making the preparations, seemed hardly possible, and since this preparation is one of considerable importance to the retail pharmacist, as well as to the large manufacturer, it was deemed of interest to investigate the matter. By the following experiments, we plainly show that if the N. F. formula is strictly adhered to, only a small loss of either nitrogen or iron is experienced. The N. F. formula is as follows:

Extract of beef	33	Gm.
Tinct. citro-chloride of iron (N. F.)	32	Cc.
Comp. spirit of orange (U. S. P.)	1	Cc.
Water, hot	62.5	Cc.
Alcohol	125	Cc.
Syrup (U. S. P.)	125	Cc.
Sherry wine q. s, to make	1000	Cc.

It is directed that the beef extract be dissolved in the hot water, and to this solution the alcohol be added with constant stirring. This mixture is allowed to stand for three days or more. It is then filtered, and the alcohol removed by distillation. The comp. spts. of orange, the tincture and the syrup are then added and the volume is made up to 1000 Cc. with the sherry wine.

100 Cc. of this preparation should represent, and if no loss occurs, should yield 0.4 Gm. $FeCl_3$ or 0.153 Gm. of metallic iron. If a high grade of beef extract is used, corresponding in nitrogen content to Liebig's (8.0 per cent.) 100 Cc. of the preparation should yield 0.264 Gm. of nitrogen, representing approximately 1.65 Gm. of proteid matter, since the nitrogen occurring as ammonia in good beef extracts is comparatively small.

As a preliminary to the making of preparations according to the above formula, the materials to be used were examined. Two samples of beef extract were obtained, No. 1 containing 7.45 per cent. total nitrogen, of which 0.28 per cent. were derived from ammonia salts, and No. 2 containing 9.8 per cent. total nitrogen, of which .003 per cent. was due to ammonia salts. Nitrates were not present in either extract. A tinct. citro-chloride of iron was used containing 3.92 Gm. of metallic iron in 100 Cc., being 91 per cent. of the strength of the N. F. tincture, which necessitated a proportionate increase in the amount used. Two brands of sherry wine were examined and used, one of Spanish origin yielding .021 per cent. of nitrogen and .072 per cent. of Al_2O_3, and the other a California wine yielding .039 per cent. of Al_2O_3 and .027 per cent. of nitrogen. The presence of these substances in the wines necessitated a correction of results, and the results reported later have been corrected according to these figures. As before mentioned, the citrate of iron and ammonia has frequently been suggested and recommended as a substitute

for the citro-chloride in Beef, Wine and Iron, and for a comparison, preparations were made using an aqueous solution of this salt, the iron and ammonia of which were previously determined.

The following five preparations were now made, the directions of the N. F. being closely followed:

1. Prepared with beef extract No. 1 and the proper amount of tr. iron citro-chloride. By calculation from the assay of materials, it should contain 0.291 per cent. total nitrogen and 0.14 per cent. of iron. It was found actually to yield 0.267 per cent. nitrogen which represents a loss of 8 per cent. of the total nitrogen taken for the preparation. This loss occurs in the two filtrations necessary, and from an examination of the residues from these filtrations was found to be 2.5 per cent. of the total in the first filtration and 3.5 per cent. of the total in the second filtration. The preparation yielded, after deducting the aluminum present, 0.136 per cent. of iron. The figure obtained shows a loss of 2.9 per cent. of the total iron originally in the preparation, the loss occurring in the second filtration as was verified by determining the iron retained in the residue on the filter.

2. Prepared with beef extract No. 1 and double the prescribed amount of tinct. citro-chloride of iron. Upon assaying the finished preparation, the following figures were obtained:

Nitrogen taken, 0.291 per cent. Nitrogen retained in preparation, 0.258 per cent.
Nitrogen lost, 11 per cent. of total.

Found by experiment:

Nitrogen lost in first filtration	3.4 per cent. of total.
Nitrogen lost in second filtration	4.6 per cent. of total.
	8.0 per cent. of total.
Nitrogen loss unaccounted for	3.0 per cent. of total.

Iron (Fe) taken, 0.273 per cent. Iron retained in preparation, 0.263 per cent.
Iron lost in preparation, 3.66 per cent. of total.

3. Prepared with beef extract No. 2 and the proper amount of tinct. citro-chloride of iron. The following figures were obtained upon examination of the finished preparation:

Nitrogen taken, 0.291 per cent. Nitrogen retained in preparation, 0.266 per cent.
Nitrogen lost, 8.6 per cent. of total.

Found by experiment:

Nitrogen lost in first filtration	3.1 per cent. of total.
Nitrogen lost in second filtration	2.5 per cent. of total.
	5.6 per cent. of total.
Nitrogen loss unaccounted for	3.0 per cent. of total.

Iron taken, 0.137 per cent. Iron retained, 0.126 per cent.
Iron lost, 8.0 per cent. of total.

4. Prepared with beef extract No. 1 and the proper amount of solution of iron and ammonia citrate, the following figures were obtained:

Nitrogen taken, 0.332 per cent. Nitrogen retained, 0.304 per cent.
Nitrogen lost, 8.4 per cent. of total.

Found by experiment:

Nitrogen lost in first filtration	2.3 per cent. of total.
Nitrogen lost in second filtration	3.5 per cent. of total.
	5.8 per cent. of total.
Nitrogen loss unaccounted for	2.6 per cent. of total.

It should be noted that the increased nitrogen content in this preparation is due to nitrogen derived from the ammonia of the iron and ammonium citrate, which, if deducted, leaves 0.291 per cent. of nitrogen derived from proteid matter.

Iron taken, 0.137 per cent. Iron retained, 0.126 per cent.
Iron lost, 8.0 per cent. of total.

5. Prepared with beef extract No. 2 and the proper amount of solution of iron and ammonium citrate. The following figures were obtained:

Nitrogen taken, 0.332 per cent. Nitrogen retained, 0.322 per cent.
Nitrogen lost, 3.0 per cent. of total.

Found by experiment:

Nitrogen lost in first filtration	1.5 per cent. of total.
Nitrogen lost in second filtration	1.2 per cent. of total.
	2.7 per cent. of total.
Nitrogen loss unaccounted for	0.3 per cent. of total.

The same remark in regard to nitrogen derived from ammonia applies here as in Exp. 4.

Iron taken, 0.137 per cent. Iron retained, 0.133 per cent.
Iron lost, 2.9 per cent. of total.

From the above experiments, it is plainly shown that the process as adopted by the N. F. is an excellent one if carried out properly and if good materials are used. The loss of nitrogen is rather insignificant considering the two filtrations necessary and the bulky and slimy nature of the precipitate. The loss of iron is comparatively large, amounting to from 3 to 9 per cent. This might be remedied by increasing the amount of iron taken, as it is shown by the experiments that a larger amount of iron added does not involve a correspondingly greater loss.

The claim that the citrate of iron and ammonia is better retained than

the tincture of iron citro-chloride is not justified conclusively by the above experiments, as, while with Exp. 5 the loss of iron is but slight, with No. 4 again the loss is as great as with the tincture.

In the light of the investigations herein described, we must conclude that by the process of the N. F., when strictly adhered to, a beef, wine and iron with the proper amount of nitrogen and iron can easily be obtained.

Baltimore, June, 1909.

ON THE KEEPING QUALITIES OF SOME U. S. P. VOLUMETRIC SOLUTIONS.

BY A. H. CLARK.

Having accumulated during the past three years considerable data on the keeping qualities of some standard volumetric solutions, I present the facts below just as they developed in the course of regular work. While feeling that the results are not conclusive, it is hoped that interest in this subject will be aroused and that the facts here recorded may serve as a basis for future work in this line or bring about profitable discussion. The investigations are still under way and it is hoped a further report can be made at some future time.

In titrating one solution against another, 25 Cc. of the one were measured into a flask or beaker by means of a "normal" pipette, and the other run in from a "normal" burette. It was found that duplicate titrations agreeing within 0.1 Cc. could readily be made, while indeed in a great majority of cases even so much variation did not occur. Considering that a difference of 0.1 Cc. means a difference in a factor of but 0.004, the average of two or more titrations agreeing within this limit was taken as sufficiently accurate.

With this modification, that is, the use of a uniform volume of 25 Cc. of the standard solution, the methods of standardization were those of the U. S. P.

The water used was invariably distilled water that complied with the U. S. P. requirements, unless otherwise stated.

The temperature of the solutions has not been considered, but care was taken in the winter that they were not unduly chilled.

The containers have been kept on a shelf in the laboratory exposed to ordinary daylight but never to direct sunlight.

Tenth Normal Sodium Thiosulphate V. S.

Solution No. 1.

Method of Preparation.—From "C. P. Granular" sodium thiosulphate and hydrant water.

Method of Preservation.—In a cork stoppered one gallon clear glass bottle.

Date.....	Sept. 17, '06.	Sept. 19, '06.	Oct. 3, '06.	Oct. 18, '06.	Nov. 7, '06.
Factor.....	.1111	1.1111	1.092	1.0776	1.0000

SOLUTION NO. 2.

Method of Preparation.—From common large crystals of sodium thiosulphate and hydrant water.

This solution showed such rapid deterioration that it was thrown out in a few days.

SOLUTION NO. 3.

Method of Preparation.—From common large crystals sodium thiosulphate and distilled water.

Method of Preservation.—Same as No. 1.

Date	Dec, 8, '06.	Dec. 26, '06.
Factor	0.9960	0.9690

So much decomposition was shown by this time (separation of sulphur) that this solution was thrown out.

SOLUTION NO. 4.

Method of Preparation.—From "C. P. Granular" sodium thiosulphate and distilled water.

Method of Preservation.—Same as No. 1.

Date	Dec. 27, '06.	Jan. 17, '07.	Mar. 1, '07.	Mar. 27, '07.	Apr. 17, '07.
Factor	1.0040	0.9843	0.9766	0.9715	0.9690

SOLUTION NO. 5.

Method of Preparation.—From "C. P. Granular" sodium thiosulphate and distilled water.

Method of Preservation.—Same as No. 1.

Date	May 23, '07.	Oct. 25, '07.	Dec. 4, '07.
Factor	1.0670	1.0593	1.0593

SOLUTION NO. 6.

Method of Preparation.—From "C. P. Granular" sodium thiosulphate and distilled water.

Method of Preservation.—Ten liters were made. Two liters (No. 6) were placed in a clear, glass stoppered bottle and kept on the shelf as usual. The balance of the solution (6B) was placed in a clear glass, cork-stoppered bottle and stored in a dark closet.

Date	Dec. 10, '07.	Jan. 29, '08.	Mar. 12, '08.	Apr. 13, '08.	May 3, '08.
Factor	1.0360	1.0228	1.0150	1.0095	1.0040

SOLUTION 6B.

On May 7, 1908, two liters were removed from the large container which had not been disturbed in the meantime, and its factor found to be 1.0150.

Date	Dec. 10, '07.	May 7, '08.	May 11, '08.	May 18, '08.	June 10, '08.
Factor	1.0360	1.0150	1.0144	1.0144	1.0104

SOLUTION 6C.

At the time this solution, No. 6, was prepared, one liter was placed in a clear glass, cork stoppered bottle and 1 Cc. $\frac{N}{1}$ sodium hydroxide added to it. This was sufficient to make it distinctly alkaline.

Date	Dec. 10, '07.	May 16, '08.	June 13, '09.
Factor	1.0360	1.0225	1.0121

Remarks.—Solutions of sodium thiosulphate decompose quite rapidly unless prepared with the most pure thiosulphate and distilled water. Even when thus prepared their titer changes in a short time. The exposure to air or light certainly effects the solution as seen by comparing the changes in No. 6 with those of No. 6B. The addition of an alkali while retarding the decomposition to some extent did not entirely prevent it, as will be seen by referring to the record of No. 6C.

NORMAL POTASSIUM HYDROXIDE VOLUMETRIC SOLUTION.

SOLUTION NO. 1.

Method of Preparation.—Prepared from potassium carbonate and milk of lime in the usual manner.

Method of Preservation.—In a one gallon amber bottle with a soda lime tube to which is attached a bulb. An outlet tube is provided so that on compressing the bulb the solution is forced out and the air that enters the bottle passes through the soda lime. This I believe is the method in common use for the preservation of alkaline V. S.

Date	Dec. 18, '06.	April 3, '07.	July 10, '07.	Feb. 17, '09.
Factor	1.0478	1.0500	1.0500	1.0500

Remarks—It will be seen that this solution retained its titer for two years and two months. It was as free from carbonate at the end of this period as when first made.

TENTH NORMAL POTASSIUM PERMANGANATE VOLUMETRIC SOLUTION.

SOLUTION NO. 1.

Method of Preparation.—Permanganate dissolved in distilled water and allowed to stand several days before determining the strength.

Method of Preservation.—In a two-liter, clear, glass stoppered bottle.

Date	April 5, '08.	May 8, '08.	Feb. 5, '09.	April 22, '09.	June 13, '09.
Factor	1.0433	1.0394	1.0420	1.0420	1.0417

Remarks.—Contrary to the usual statements, this solution has retained

its titer fourteen months. This would seem to agree with the recent investigations of Collitt. (Pharm. Journ., Dec. 5, 1908, p. 724.)

Tenth Normal Bromine Volumetric Solution.

Solution No. 2.

Method of Preparation.—From "C. P." potassium bromide and bromate.

Method of Preservation.—In a two liter, clear, glass stoppered bottle.

Date	Dec. 11, '06.	Dec. 27, '06.
Factor	1.0520	1.0520

Solution No. 3.

Date	Jan. 29, '07.	Feb. 27, '07.	May 23, '07.	April 13, '08.
Factor	1.0390	1.0337	1.0371	1.0390

Solution No. 4.

Date	April 13, '08.	May 7, '08.	May 13, '08.
Factor	1.0226	1.0231	1.0230

Solution No. 5.

Date	May 20, '08.	June 10, '08.	April 22, '09.	June 13, '09.
Factor	1.0144	1.0144	1.0148	1.0148

Remarks.—The above seems to indicate that a tenth normal bromine solution does not change its titer at least within fifteen months. No. 3 retaining its titer that long and No. 5 for more than twelve months.

Tenth Normal Iodine Volumetric Solution.

Solution No. 1.

Method of Preparation.—From "Resublimed Iodine" and "U. S. P." potassium iodide.

Method of Preservation.—In a two liter, clear, glass stoppered bottle.

Date	Sept. 20, '06.	Oct. 18, '06.	Feb. 20, '07.
Factor	0.9288	0.9133	0.9164

Solution No. 2.

Method of Preparation and Preservation.—Same as No. 1.

Date	May 8, '08.	Jan. 29, '09.	April 22, '09.	June 13, '09.
Factor	0.9541	0.9337	0.9344	0.9341

Remarks.—It seems from the record that decomposition takes place in this solution when freshly prepared. After standing the titer remained constant for some time, in the case of No. 2 five months.

Tenth Normal Potassium Sulphocyanide Volumetric Solution.

Solution No. 1.

Method of Preparation.—From "C. P." potassium sulphocyanide.

Method of Preservation.—In a one liter cork stoppered clear glass bottle.

Date	Oct. 20, '06.	April 22, '09.	June 13, '09.
Factor.....	1.0636	1.0650	1.0653

Remarks.—The record speaks for itself. For approximately two and a half years this solution has retained its titer.

Tenth Normal Silver Nitrate Volumetric Solution.

Solution No. 0.

Method of Preparation.—From "U. S. P." silver nitrate.

Method of Preservation.—In a one liter, amber colored glass stoppered bottle.

Date	Dec. 3, '05.	April 16, '06.	May 3, '06.	Aug. 12, '06.
Factor.....	1.0460	1.0460	1.0460	1.0460

Solution No. 1.

Method of Preparation and Preservation.—Same as No. 1.

Date	Oct. 20, '06.	Jan. 17, '07.
Factor.....	1.0050	1.0070

Solution No. 2.

Method of Preparation and Preservation.—Same as No. 1.

Date	Dec. 16, '08.	April 22, '09.	June 13, '09.
Factor.....	1.0823	1.0823	1.0823

Remarks.—Solution No. 0 retained its titer eight months.

A NOTE ON THE ASSAY OF JALAP U. S. P.

BY A. H. CLARK.

In following the U. S. P. directions for the assay of jalap, when the resin is finally extracted from the alcoholic percolate with chloroform, an emulsion invariably forms which takes from twelve hours to two or three days to separate completely.

The U. S. P. directs that the drug be exhausted with ether to obtain ether-soluble resin, then directs to "continue the percolation with alcohol," etc., to obtain the alcohol-soluble resin, but fails to take into consideration the ether still remaining in the drug. If these directions are followed strictly the emulsion above referred to invariably forms. If however the ether is removed before continuing the percolation with alcohol no emulsion forms when the percolate is mixed with chloroform and water no matter how violently it be shaken, and complete separation takes place in from one-half to one hour.

A current of air drawn through the percolator by means of a filter pump for a few minutes, stirring the powder with a glass rod during the time is

a convenient method of removing the ether. If a filter pump is not available the powder may be removed to an evaporating dish and the ether allowed to evaporate spontaneously, returned to the percolator and the operation continued.

THE ASSAY METHODS OF THE U. S. P.

BY A. R. L. DOHME AND H. ENGELHARDT.

Since the publication of the present U. S. P. several papers have been published dealing with the official assay methods of the drugs and the galenical preparations. While the assay methods of the U. S. P., especially after the corrections on May 1, 1907, had been published, give rather accurate results, the carrying-out of these processes in several cases is very tedious, and might advantageously be replaced by other more expeditious but at the same time just as accurate methods.

A good many assay processes have been worked out and published during the last few years, and some of these, as we have found by experiment, are decidedly superior to those of the U. S. P., and should seriously be considered for adoption in the next pharmacopœia by the committee.

Articles of recent dates by Puckner (Pharm. Rev., 1907, page 303), by Umney and Bennet (Pharm. Journ., 1908, II, 344), by Roberts (Am. Journ. Pharm., 1909, No. 3), Bernegau (ibid.), and others, which refer to the assay methods of the U. S. P., have induced us to give our experience with the official methods and with some of the new processes published during the last few years.

From many sides the processes in which an aliquot part is taken are condemned as being faulty, the aliquot part not always presenting the exact amount desired. While we agree in general with this view, we wish to point out at the same time that for practical purposes the shorter method of taking an aliquot part is sufficiently accurate, a view which is also taken by Fromme (Geschaeftsberichte C. & L., 1907, page xxv).

Aconite.—The filtration of the acid liquid is very tedious, even in the greater dilution as given in the corrections. Keller's method, *i. e.*, the extraction of the drug with ether or ether-chloroform in presence of ammonia, of a fixed alkali or alkali-carbonate gives good results. A similar method, with the necessary modifications, could be applied for the assay of the fluidextract.

Belladonna and the Mydriatic Drugs.—The official methods give very good results, and are easily carried out. Keller's method gives results very close to those obtained by the official method. The methods for the fluidextracts of these drugs and also of the extracts are good, with the exception of extract henbane. The directions are: "The method to be employed is identical with that given for extract of belladonna leaves, using 10 grammes of extract hyoscyamus instead of the quantity there directed." 5 Cc. of alcohol and 10 Cc. of water, given under extract of belladonna

for dissolving 5 grammes of this extract, would never suffice to dissolve 10 grammes of extract of henbane. A larger quantity of these menstrua must be allowed. Besides this, the quantity of chloroform given, 20 Cc., is in most cases insufficient, and very objectionable emulsions are liable to occur, to say nothing of the difficulty of distinguishing the deep-colored chloroformic layer from the dark aqueous fluid.

Cinchona.—We have pointed out on several occasions that the U. S. P. method for assaying this drug might very easily be improved upon. While the amount of ether and chloroform (even the increased quantities of the "corrections") may be sufficient for drugs with up to 8 or 9 per cent. of total alkaloids, it is insufficient for barks with higher alkaloidal contents. A method which gives excellent results, and which at the same time is expeditious, is that originated by Fromme, a modification of Keller's method. The details of a similar method * are given by Puckner in Pharm. Rev., 1907, page 310. In this method the drug (a much smaller quantity than that used in the U. S. P. process, 2.5 grammes instead of 15 grammes as directed there) is extracted with hot diluted hydrochloric acid; the acid apparently splits up the cell-walls and allows the ether-chloroform to come better in contact with the alkaloids. The ether-chloroform mixture alone, besides being insufficient for dissolving all the alkaloids in a high-grade drug, does not seem to have a sufficient dissolving power for the cell-walls. By this method the total alkaloids are determined only; with a slight modification it could be adapted to the determination of the ether-soluble alkaloids also. But is it necessary to determine these, especially by a method like that of the U. S. P., which in the hands of different workers usually gives different results? A method which depends so much on physical conditions, and, therefore, cannot be carried out very easily? Numerous determinations of ether-soluble alkaloids in cinchona barks have been made in this laboratory, but the results were far from being satisfactory. This was not at all due to careless manipulation, but to physical conditions, temperature, etc., which were difficult to control. The U. S. P. is the only pharmacopœia in which cinchonine is excluded from the determination, all the other existing pharmacopœias determine the total alkaloids or these and quinine alone. In applying the U. S. P. method for assaying cinchona bark, the resulting alkaloids are very often mixed with resinous or waxy matter. Fromme (loc. cit.) therefore proposes to titrate the alkaloids, and he proceeds in the following way: The alkaloids are dissolved in 10 Cc. of alcohol, and to this solution 10 Cc. of ether and 30 Cc. of water are added. After addition of a few drops of hematoxylin solution, $\frac{N}{10}$ acid is added gradually, shaking well after each addition until the alkaloids are nearly neutralized.

* Published by Philipp Roeder in his Jahresbericht. This method has no advantage over Fromme's method.

Then 10 Cc. of water are added and some more acid, and finally 30 Cc. of water and sufficient acid to produce a lemon-yellow color. Each Cc. of $\frac{N}{10}$ acid corresponds to 0.0309 grammes of cinchona alkaloids. The proportions just given are for the total alkaloids from 2 grammes of cinchona bark, and should be increased accordingly for the alkaloids obtained from the 5 grammes of bark as directed in the U. S. P.

Umney and Bennet criticise the aliquot part taken in the assay process given for fluidextract of cinchona, claiming that the amount of the ethereal solution taken represents more than one-half of the fluidextract used for assay. That the aliquot part represents one-half of the fluidextract taken was sufficiently proven by the Committee on Proximate Assays. The method works well, but here too where the ether-soluble alkaloids are determined, it is naturally difficult to obtain concordant results in the hands of different workers.

One fact may be mentioned here. A chloroformic solution of the cinchona alkaloids should never be allowed to stand for any length of time, as, according to Panchaud, the alkaloids decompose the chloroform with the formation of phosgene (carbonoxychloride) and hydrochloric acid, and appear consequently in the residue not as alkaloids, but partly as hydrochlorides.

Coca.—The assay process works well. Keller's method, modified by de Jong, gives very good results also. The method is carried out as follows: 15 grammes coca leaves in fine powder are macerated with 150 grammes of ether and 6 grammes of ammonia water (10 per cent.) for one-half hour at 0° C. with frequent shaking. The mixture is then shaken with 20 grammes of distilled water at 0° C., and after perfect clearing 100 grammes of the filtered ethereal solution are shaken with 50 grammes of one-half per cent. hydrochloric acid, followed by 25 grains of acid of the same strength. The combined acid solutions are made alkaline with ammonia and shaken with 50, 20 and 10 Cc. of ether respectively. The ether is then removed by distillation, the residues dried to constant weight and weighed. As a control, the alkaloids are titrated in the usual way.

In the official assay process for the fluidextract of this drug, it sometimes happens that emulsions occur. The drug at times contains an excessive amount of mucilaginous matter, and in such a case a larger amount of ether than prescribed should be allowed.

Colchicum seed and colchicum root.—We have mentioned on other occasions that the U. S. P. process for these drugs and the preparations thereof does not yield the proper amount of colchicine, that the alkaloid is always contaminated with some foreign, especially with some fatty and waxy matter, and that the results consequently are too high. In manufacturing colchicine on a large scale, applying a process similar to that of the U. S. P. assay process, we found that the yield of pure colchicine fell much (about 30 per cent.) below the amount calculated from the assay. The

colchicine obtained by the U. S. P. assay method should be purified and the final product should be perfectly soluble in water. Fromme (*loc. cit.*) reports that by dissolving the colchicine as obtained by the U. S. P. process in a small quantity of chloroform, adding to this a small quantity of ether and precipitating the colchicine by petrolether, he noticed a loss of 40 per cent. The purification process as recommended by Panchaud (Schweiz. Woch. f. Chemie & Phar., 1906, page 563) is given in Puckner's paper (Pharm. Rev., 1907, page 322). The assay processes for the galenical preparations of colchicum seed and corm work well, but the resulting colchicine should be subjected to the same purification. Lyons (Am. Drugg. and Pharm. Record) has recently published an assay process for colchicum corm, in which he determines the purity of the crude colchicine by titrating with Mayer's reagent.

Conium.—There is very little use for this drug and its preparations. Umney and Bennet (*loc. cit.*) consider the U. S. P. process not at all satisfactory. They claim that "the ammonium sulphate does not separate completely and that the neutralization with sodium carbonate requires very great care." We also have found much difficulty in carrying out the process, but we do not wish to offer any criticism at the present time, as our experience with the process is too limited. We would like, however, to recommend again, as we did when the assay processes were worked out in the committee of proximate assays, to mix the final ethereal solution with ether saturated with hydrochloric acid gas. By removing the menstruum from such a mixture there is less chance for the coniine hydrochloride to volatilize, than by evaporating an aqueous hydrochloric acid, even with the aid of alcohol as directed by the U. S. P. We have obtained very good results by applying the Prescott-Gordin iodometric method for the determination of the volatile alkaloid sparteine, and it is very likely that this method can be applied for the determination of coniine also. It would not be necessary to eliminate the ammonia so carefully, as this cannot interfere with the determination. We expect to work out a process along these lines.

Guarana and Kola.—The assay method for guarana and the fluidextract works well, the resulting caffeine being usually perfectly white.

It is difficult to understand why an assay of kola nut and its fluidextract is not adopted by the U. S. P. Kola nuts vary widely in the amount of caffeine they contain, and very poor samples were submitted for purchase recently. A method like that used for guarana should be adopted.

Hydrastis.—The U. S. P. uses a method for the determination of hydrastine in the drug different from that used for the fluidextract. The former depends on the insolubility of berberine in ether, while in the latter the berberine is precipitated by potassium iodide as hydroiodide. Although there is very little difference in the results obtained by using the one or the other of the two methods, for uniformity's sake it would be

better to apply one method in both cases. Puckner (Pharm. Review, May, 1908, page 132) has published methods for the drug as well as for the fluidextract, depending on the precipitation of the berberine with potassium iodide, and eliminating the aliquot part. We have had occasion to try these methods several times, and to find that they give very good results. Eldred and Pence (Proc. A. Ph. A., 1908, page 836) have modified Puckner's method and have obtained still higher results. The amount of hydrastine found is higher than that obtained by the official method, but not enough to warrant a change of method. The alkaloid usually is of a somewhat brownish color, but it has been found by several investigators that the coloring matter has only a slight influence on the results. Some samples of hydrastis contain considerably more canadine than others, which also might be the cause for the different coloration of the residue.

The amount of hydrastis taken for assay is entirely too high. 10 Gm is quite sufficient, considering the high percentage of alkaloid present in the drug.

Ipecac.—Umney and Bennet claim that by washing the acid solution made alkaline with ammonia, with ether, lower results are obtained than by washing with chloroform, as ether, according to Bird, is not a suitable solvent for ipecac alkaloids. This is only true as far as psychotrine is concerned, which is present in ipecac in quantities from 0.02–0.32 per cent., as found by Fromme (C. & L., 1903). The same author and other investigators found that ether extracts the two principal alkaloids emetine and cephaeline as well as chloroform. Besides this, the extraction with ether furnishes a residue which can easily be titrated, while the alkaloids obtained by extracting with chloroform are of a very dark color. The assay methods both for the drug and the fluidextracts as given in the U. S. P. are good.

Jalap.—We did not experience any trouble in carrying out the assay process as outlined in the U. S. P. In shaking out the aqueous-alcoholic solutions with chloroform, emulsions sometimes occur which are very difficult to break up. In such cases a larger amount of chloroform than prescribed should be allowed. For determining the total resin we prefer Keller's method, modified by Fromme, which is carried out as follows: 7 Gm. powdered jalap are boiled in a flask provided with a condensing tube with 70 Gm. of absolute alcohol for two hours. After cooling, any alcohol lost by evaporation is replaced, and after thorough mixing 51 Gm. (= 5 Gm. jalap) of the alcoholic solution are filtered into a tared porcelain dish, and after the addition of a few Cc. of water, evaporated to dryness. The residue is washed in the usual way with hot distilled water, the resin dried at 100° C. to a constant weight and weighed. Weight multiplied by twenty gives the percentage. We have applied this method on frequent occasions and we have found that it gives higher results than the

U. S. P. method. Is it necessary to determine the ether-soluble resin? Jalap root has an appearance wholly different from that of those drugs botanically and chemically related to it, viz., scammony root and orizaba root, and cannot very well be mistaken for these. Only in case of a powdered drug might it be of advantage to determine the amount of an ether-soluble resin, to decide whether or not the drug is contaminated with one rich in scammonin.

Nux Vomica.—The assay method of the U. S. P., *i. e.*, the determination of the strychnine by destroying the brucine with nitric acid, is not entirely satisfactory. The results are in most cases too high, and differ widely in the hands of different workers. We have tried the different modifications offered during the past few years, but we have not obtained good results as yet. The fact that the results usually run too high might be explained by the impure mixture of the alkaloids subjected to the oxidation. It is very difficult, if not impossible, by following the official process, to obtain the alkaloids in a sufficiently pure state; they usually are contaminated with foreign substances, wax, soap, etc., which are carried into the final chloroformic solution, and which apparently are acted upon by the nitric acid first, thus consuming a portion of the acid necessary to oxidize the brucine.

The assay methods for the fluidextract and the extract are not satisfactory, and might easily be improved upon. It is difficult to bring the extract in solution (or rather suspension) in the official solvent, ether, chloroform and ammonia water. It would be preferable to expel only the alcohol from the fluidextract, not evaporate the latter to dryness, and transfer- this aqueous liquid to a separator with the aid of the official menstruum. The solid extract should be dissolved in diluted alcohol, the alcohol be removed by evaporation and the resulting aqueous suspension transferred to a separator.

Opium.—Perhaps there is no drug for which so many assay processes have been devised as for opium. M. Franke * in an article, "Ueber die Verfahren zur Bestimmung des Morphins, Codeins and Narcotins im Opium," gives a review of the different methods. He reports on forty-four methods in which the morphine is precipitated by ammonia, on two processes in which carbonates are used, partly to eliminate the calcium salts and meconic acid, partly to precipitate the alkaloid. In seven methods lime is used for the extraction of the morphine, and to these the methods of the British Pharmacopœia and Stevens' method should be added, which Franke omits. Two methods depend on the reducing properties of morphine, and in these the morphine is determined gravimetrically or volumetrically, while in three other processes, depending on the same properties of morphine, the alkaloid is determined colori-

* Ap. Ztg., 1908, Nos. 34, 35, 36. 39, 41, 42, 43, 44, 48 and 52.

metrically. One method depends on the precipitation of morphine with Mayer's solution, and finally, one process is carried out by polarizing a specially prepared aqueous extract of opium.

A great many of these methods are of theoretical value only, and of no practical avail. A few years ago a sub-committee of the Association of Official Agricultural Chemists investigated the opium assay question, and as the result of numerous assays by different chemists, the present method of the U. S. P. was found to be the best and provisionally adopted. There is no doubt that this method gives rather concordant and high results, higher than those obtained by most of the other methods. A disadvantage of the method is that it takes very much time to carry out.

The morphine usually is of a rather high purity. The filtering of the liquid containing the crystallized morphine might advantageously be done with the aid of a filter-pump. The same manipulation we use in filtering the solution of morphine in lime water. The filtration is very rapid, and there is little chance for the formation of calcium carbonate. The time allowed for the morphine to crystallize, viz., sixteen hours, is correct. Numerous assays carried out about five years ago in this laboratory have shown that the separation of calcium meconate usually takes place after sixteen hours' standing.

While the assay process for tincture opium works very well and gives satisfactory results, in assaying the extract we at times experienced difficulty in obtaining a clear filtrate from the aqueous solution. Repeated filtration did not produce a clear liquid. By making a tincture of the fluidextract and subjecting this to the official assay method, we often overcame this trouble.

Physostigma.—The assay process for this drug works well. A sodium-bicarbonate free from carbonate and caustic alkali must be used, as these two, especially the latter, decompose the eserine very rapidly. The assay of the extract is a very tedious one. The mixture of extract and quartz sand is usually so hard, that it is difficult to loosen it for transferring. The evaporation to dryness is not at all necessary. The liquid should be heated until all the alcohol is expelled. The resulting mixture will still be moist and can be transferred much more easily than when dry.

The simple process of dissolving the extract in diluted alcohol and shaking out the solution with ether, after the addition of sodium-bicarbonate solution, etc., gives rather good results, doing away at the same time with the aliquot part. Cochineal can be used as indicator as well as iodoeosin. The tincture might be assayed in a similar manner.

Pilocarpus.—The U. S. P. method for assaying these leaves is good. In the assay of the fluidextract the same difficulty in loosening the sand mixture from the dish is experienced as in the assay of extract of physostigma, and here a similar modification as just mentioned for physostigma should be applied. The short process (shaking out the fluidextract with

chloroform after rendering it alkaline with ammonia) gives good and correct results, but at times, especially when too little chloroform is used, very objectionable emulsions occur, due to the presence of mucilaginous matter.

In conclusion, we wish to call attention to a few drugs, for which assay processes should be adopted in the new edition of the U. S. P. Cantharidine should be determined in Spanish flies. This article is often of a rather questionable quality.

Crocus is a drug which is very often adulterated. Ash and coloring power should be determined, and the drug should be admitted again to the U. S. P.

Requirements for extract of malt as to percentage of maltose and diastatic power should be given.

Hunt (Jour. Am. Med. Assoc., Vol. 41, 1385–88) calls attention to the fact that the thyroid glands vary very much in the percentage of iodine, and that the present qualitative test for this element should be replaced by a quantitative one.

It has been found that the amount of strophanthin as found by chemical assay is in direct proportion to the physiological action (Fromme and Focke, Geschäfth. C. & L.). As a good method for the determination of strophanthin is available, it should be adopted by the U. S. P.

IDENTIFICATION OF FLUIDEXTRACTS.

BY H. M. GORDIN.

In a paper which I read at one of the meetings of the Chicago Branch of the American Pharmaceutical Association in 1909, and which was published in the "Bulletin of the A. Ph. A." and the "American Druggist," 1909, 37, I have shown the advisability of introducing into the U. S. P. methods for the identification of powdered drugs and galenicals. The points brought out in that paper can be summarized as follows:

1. Since the therapeutic value of a galenical preparation depends both on the value of the drug from which the galenical is made and on the nature of the method by which the galenical is made, the U. S. P. ought to give methods for proving both that a drug is of a standard quality and that a galenical was made by the U. S. P. method.

2. Since alkaloidal assays are only applicable to alkaloid-bearing drugs and to galenicals made from such drugs, and since an alkaloidal assay only shows the amount of alkaloid present, but does not show that a galenical was made by the U. S. P. method, we ought to have, even in the case of alkaloidal drugs, methods for showing that the U. S. P. method was used in preparing a galenical. The fact that galenicals containing active principles are used at all shows that galenicals have other therapeutic values aside from those due to these active principles, otherwise physicians would prescribe only these principles instead of the galenicals

containing them. Since it is quite easy to prepare galenicals from alkaloidal drugs by cheap methods which yield preparations containing the required amount of alkaloid, and nevertheless differing entirely from preparations made by the U. S. P. methods with respect to general therapeutic effect, we ought to have methods by which to prove that the galenicals used by pharmacists were made by methods prescribed by the U. S. P. This could be easily done by requiring galenicals to correspond to certain constants established by the Committee of Revision. For example, every fluidextract should be required to have a certain specific gravity and a certain strength in alcohol, and to yield upon evaporation a certain amount of solid residue, leaving a certain reasonable margin for unavoidable fluctuations. The introduction of even these constants alone would, in my opinion, at once make it impossible to substitute cheap methods for those prescribed by the U. S. P. in making fluidextracts. The objection that the determination of those constants is too complicated for the ordinary pharmacist is certainly untenable, since any one will admit that a determination of specific gravities and of the amounts of alcohol by means of the Westphal balance and the determination of amount of solid residue are much simpler than the operations involved in alkaloidal assays.

It may be said that a determination of these constants of a fluidextract would not enable us to tell from what drug the fluidextract was made. But since in most cases the question is only whether a fluidextract sold under a certain name was made by the U. S. P. method, and since an extract made by this method would have certain constants, the determination of these constants would quickly show whether the U. S. P. method was used or not.

In order to show that the specific gravity, the alcoholic strength and the amount of solid residue of any fluidextract remain quite constant even when the extract is made from different batches of a drug, I have prepared fluidextracts from several drugs and determined these constants. Of each drug two or three different samples, obtained from different dealers, were taken and worked up into fluidextracts by the methods given in the U. S. P.

The drugs were not dried and no special care was taken in making these fluidextracts. For this reason I would not advise to use the data given in the following table as standards for U. S. P. preparations. My intention was only to show that even when prepared without special care the variations in these constants are quite small. The values to be introduced into the U. S. P. should be determined by the Committee of Revision upon fluidextracts made from drugs of known good quality under proper conditions.

It is clear that the identification of fluidextracts could be made more complete by determinations of more constants, *e. g.*, amount of water required to produce permanent turbidity, angle of refraction, etc. For

practical purposes, however, a determination of the specific gravity, of the strength in alcohol, and of the amount of solid residue would be quite sufficient for preventing the substitution of cheap sophisticated methods for those given in the U. S. P.

As will be seen from the following table, the alcoholic strengths of the fluidextracts made from different samples of the same drug agree within 2 per cent., while the specific gravities and the amounts of solid residue differ to a somewhat greater extent. Some fluidextracts, particularly those containing glycerin, could not be dried to constant weight. The contents in alcohol and the specific gravities were determined at 25° C.:

Fluidextract.	Per cent. absolute alcohol by volume.	Specific Gravity.	Extractive in 10 Cc.
Viburnum Opulus	53	.9728	2.0726
Viburnum Opulus	55	.9367	1.2754
Sumbul	54	.9466	2.1046
Sumbul	52	.9654	2.7936
Gentian	32	1.1184	
Gentian	33	1.0577	2.6478
Gentian	33	1.1035	3.8536
Granatum	33	1.1119	
Granatum	35	1.0767	
Krameria	38	1.0335	2.3378
Krameria	36	1.0323	2.3830
Lappa	40	1.0270	2.0276
Lappa	40	1.0640	2.6014
Mezereum	70	.9059	1.0514
Mezereum	70	.9220	1.0906
Stillingia	42	.9977	1.2150
Stillingia	43	.9914	1.1016
Stillingia	42	1.0017	1.3634
Staphisagria	48	.9074	
Geranium	44	1.0885	4.4618
Taraxacum	31	1.0454	2.0306
Taraxacum	32	1.0761	2.8696
Veratrum	90	.8359	.6000
Veratrum	89	.8440	.6812

I wish to express my thanks to Messrs. J. O. Browder and E. H. Coburn for carrying out the determination of the constants given in the table.

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ON THE CRYSTALLINE ALKALOID OF CALYCANTHUS GLAUCUS.*

(Third paper continued.)

BY H. M. GORDIN.

In the paper presented at the last meeting of the American Pharmaceutical Asssociation I showed that the alkaloid obtained from a new batch of calcycanthus seeds, while having the same formula as the calycanthine obtained from the first batch of seeds, had a different melting point and refused to give off its water of crystallization, when heated, without undergoing decomposition. When kept in vacuo over sulphuric acid it lost its water of crystallization so slowly that even after several months drying all the water did not go away. The new alkaloid was named isocalycanthine and was analyzed in form of some of its salts. Having failed to obtain anhydrous isocalycanthine by drying it in vacuo over sulphuric acid at ordinary temperature, attempts were made to dry one Gm. of powdered crystals at 120° for eight hours in a current of hydrogen and at 130° in vacuo over phosphoric anhydride. In neither case was the dehydration complete, as shown by the fact that the alkaloid so dried, when put in vacuum over sulphuric acid, again began losing in weight. I am still keeping a quantity of isocalycanthine in vacuo over sulphuric acid, weighing it once a month. It is quite probable that after a year or so the weight will become constant. In the meantime I have devised a method by which isocalycanthine can be obtained anhydrous from the start. For this purpose the crystallized alkaloid is dissolved in chloroform which dissolves it quite readily, but the solution is turbid and does not become transparent even upon addition of considerable quantities of the solvent, showing that the turbidity is due to separation of the water of crystallization. The turbid solution is shaken with calcined potassium carbonate and filtered. The solution is kept in vacuo over paraffin till all the chloroform is absorbed by the latter. A crystalline mass remains which is anhydrous isocalycanthine. A quicker way is to reduce the volume of the solution to one-third by passing a brisk current of dry hydrogen over its surface and then adding a considerable amount of petroleum ether. On standing over night most of the alkaloid crystallizes out in anhydrous condition.

The alkaloid obtained by either of these methods has a slightly yellowish tint. It begins to darken at 220° and melts at 235°–236° C.

Analysis gave C, 75.14 and 75.71 per cent.; H, 7.54 and 7.64 per cent.; N, 15.78 per cent. Calculated for $C_{11}H_{14}N_2$: C, 75.77 per cent.; H, 8.12 per cent.; N, 16.12.

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* The crude material from which the alkaloid was obtained was prepared in accord with my directions by Eli Lilly and Company who deserve my heartiest thanks for the care with which they prepared the extract.

While the results of the analyses are slightly below the theoretical, they leave no doubt about the alkaloid being anhydrous.

Besides the salts reported upon in the last paper the following were made. They were made by the same methods as the corresponding salts of calycanthine:

Isocalycanthine Neutral Sulphate, $(C_{11}H_{14}N_2)_2.H_2SO_4$. Flocculent precipitate darkening at 208° C. and melting to black liquid at 218°–219° C.

0.1943 Gm. dissolved in 25.5 Cc. water gave at 26.5° in 200 Mm. tube a rotation of 5.5°. Hence $[a]_D = 360.89°$.

0.2759 Gm. gave 0.1319 Gm. $BaSO_4$ and 0.2674 Gm. gave 0.1275 Gm. $BaSO_4$.

Calculated for $(C_{11}H_{14}N_2)_2.H_2SO_4$, 7.15 per cent. S. Found, 6.56 and 6.56 per cent. S.

Isocalycanthine Picrate, $C_{11}H_{14}N_2.C_6H_2(NO_2)_3OH$. Long yellow silky needles, melting at 175–180° C. The salt seems to contain about ¾ molecule of water of crystallization. 0.5911 Gm. lost in vacuo over sulphuric acid 0.0181 Gm. Found, 3.06 per cent. H_2O. Calculated for $C_{11}H_{14}N_2.C_6H_2(NO_2)_3OH.\frac{3}{4}\ H_2O$, 3.22 per cent. H_2O.

0.1427 Gm. hydrated picrate gave 21.6 Cc. N (b = 746; t = 22°). Found 16.74 per cent. N. Calculated for $C_{11}H_{14}N_2.C_6H_2(NO_2)_3OH.\frac{3}{4}\ H_2O$, 16.81 per cent. N.

Isocalycanthine picrolonate, $C_{11}H_{14}N_2.C_{10}H_8N_4O_5$.

After repeated trials the following method was found to be the best for making this salt. Dissolve 1 Gm. isocalycanthine in 20 Cc. cold alcohol previously mixed with 1.5 Cc. acetic acid (36 per cent.). Add to the solution a filtered solution of 1 Gm. picrolonic acid in about 100 Cc. cold alcohol. Heat the mixture till all is dissolved, add hot water to turbidity and set aside over night. The picrolonate crystallizes out in very pretty yellowish-brown silky needles melting at 200° C. It is easily soluble in alcohol but insoluble in water.

0.1889 Gm. gave 32.1 Cc. N (b = 741; t = 22°).

Found 18.67 per cent. N. Calculated for $C_{11}H_{14}N_2.C_{10}H_8N_4O_5$, 18.75 per cent. N.

Isocalycanthine Nitrosamine, $C_{11}H_{13}N_2.NO$.

It was made by the same method as calycanthine nitrosamine, but all attempts to obtain it in crystalline form were unsuccessful. It was purified by dissolving it in pyridine and throwing the solution in much cold water. Yellowish powder. Darkens at 99° and melts at 106°–107° C.

0.1597 Gm. gave 29.6 Cc. N (b = 754; t = 20°).

Found, 20.93 per cent. N. Calculated for $C_{11}H_{13}N_2.NO$, 20.72 per cent. N.

Like calycanthine, isocalycanthine seems to contain a CH_3N group.

0.3650 Gm. gave by Herzig and Meyer's method 0.3021 Gm. AgI. Found 5.28 per cent. CH_3. Calculated for $C_{10}H_{11}N.N.CH_3$, 8.63 per cent. CH_3.

While the results are far below the theoretical, they leave no doubt about the presence of a CH_3N group.*

Isocalycanthine seems to form two oxalates. They were made but not analyzed.

The alkaloid also forms a sulphonic acid which will be reported upon later.

The work is continued.

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THE ALKALOIDS OF MENISPERMUM CANADENSE—PRELIMINARY COMMUNICATION.

BY H. M. GORDIN.

The rhizome and roots of yellow parilla were first investigated by Maisch.† He reported the presence of a small quantity of berberine and of a white alkaloid, which he named menispine. Subsequently the drug was investigated by Barber,‡ Young,§ and Berkmeier ‖. That berberine is not present in the drug in detectable quantities I have shown in a previous paper.¶

In order to gain some preliminary information about the nature of the alkaloids of yellow parilla, I have made the following experiments:

On shaking a few grams of the powdered drug with ether, filtering the liquid and shaking out the ethereal solution with acidified water, an aqueous liquid was obtained in which neither Mayer's nor Wagner's reagent gave any indication of the presence of alkaloids. Hence the alkaloids in the drug are most probably in the form of salts, not in the free condition.

An assay of the drug by means of Prollius' fluid, using chloroform for the final shaking out, showed that the drug contained 3 per cent. of crude dark-colored alkaloids which are completely soluble in chloroform, but only partly soluble in ether. By extracting the crude alkaloids with ether it was found that the 3 per cent. consisted of 1.2 per cent. of ether-soluble alkaloidal matter, and 1.8 per cent. of alkaloidal matter soluble in chloroform, but insoluble in ether.

Both alkaloidal substances are difficultly soluble in water, and still less in presence of sodium carbonate. They are quite soluble in excess of ammonia, and extremely easily soluble in excess of potassium hydroxide.

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* The low results are possibly due to the wandering of the CH_3 group into the ring.

† Am. J. Pharm., 1863, 301.

‡ Ibid., 1884, 401.

§ Proc. Am. Pharm. Assoc., 1892, 296.

‖ Ibid., 272.

¶ Arch. Pharm., 240, 146.

This accounts for the very small yield obtained by previous investigators who used alkali instead of alkali carbonate for precipitating the alkaloids.

From acid solution the alkaloids are not extracted by chloroform, showing that their basicity is not very feeble.

Several experiments were made with a view of finding the best menstruum for extracting the alkaloids. It was found that cold alcohol extracts about 50 per cent., while hot alcohol extracts about 80 per cent. of total alkaloids.

The investigation is to be continued.

Northwestern University School of Pharmacy.

THE MICROSCOPY OF LARKSPUR AND STAVESACRE.

BY CHARLES W. BALLARD.

In the literature at present available on the subject, the microscopy of larkspur and stavesacre is not treated very exhaustively, probably owing to an impression that the wide difference in appearance of the whole seeds renders improbable the substitution of one for the other. Besides, the medicinal properties of both being similar, preparations made from a powder containing a mixture of the two would probably have similar therapeutic effect and adulteration would thus not be apparent. In view of this fact the substitution of one drug for the other becomes more difficult to detect and correspondingly easier for the persons engaged in this practice. The difference in price furnishes the main reason for this substitution.

The appearance of these seeds in the whole condition is very likely familiar to all. The chief differences lie in size and color, larkspur being brownish-black and about one-fifth the size of stavesacre, which is of a grayish-brown. Botanically they are both in the Family Ranunculaceæ, larkspur being defined as the ripe seed of *Delphinium consolida* and stavesacre as the ripe seed of *Delphinium staphisagria*. It is said that several species of larkspur seed enter into the commercial article and one authority has stated that most of the seed on the market is not *D. consolida* but *D. ajacis*. The color of the powders of larkspur and stavesacre, while not a reliable characteristic, is of some value, if only as a preliminary to microscopical examination. The powder of larkspur is of a grayish-black color, that of stavesacre is a brown. Both powders are exceedingly oily owing to the large amount of fixed oil present.

In studying these seeds microscopically, they may for convenience be divided into two parts, endosperm and seed coats. The latter is the more important, as the diagnostic elements are found in this part. Endosperm and seed coats are enough alike in both seeds to show a botanical relation and yet are sufficiently different to render the task of distinguishing between them simple. The endosperm cells in both seeds are very similar. They are large, thin-walled and nearly circular in shape but toward the

seed coat they become small and angled. The contents of the endosperm cells consist of large masses of aleurone grains, starch being absent. Therefore the powder should not give a blue coloration with aqueous KI iodine, as aleurone gives a brown color with this reagent. The seed coat of both larkspur and stavesacre has three layers, the outer and inner being very prominent. The middle layer is not of as much importance from the standpoint of the microscopist.

The outer layer of the seed coat of larkspur is the most characteristic. It not only serves to distinguish larkspur from stavesacre but from most other seeds. Under the microscope it appears as brownish-black fragments, the individual cell being surrounded by wavy or convoluted walls, which, by reason of the white intercellular substance, appear as white, wavy lines on a dark background of cell substance. Very often small protuberances are seen on the outer surface of this layer, or when seen from above they appear as small pits on the surface. These are not of great importance in diagnosis, many other seeds also having modified structures on their outer coat. The cells of this layer are more resistant to grinding than any other part of the seed, and as they are so well defined they would be the element that one would observe first in a larkspur powder. The cells are approximately rhombic or polygonal in shape and are of about the same size in all samples. In relative size they stand between the cells of the inner and middle layers.

The middle layer of the coat of larkspur cannot be said to be a diagnostic element because it is so delicate that in powdering it disappears. The cells are larger than those of the outer layer, are white in color, rectangular in shape and their walls are not convoluted.

The inner layer of the coat of larkspur is also of value as a diagnostic element, but is not of as much use in this connection as is the external layer, for many other seed powders contain a similar element. It is useful in the differentiation of larkspur and stavesacre. The color of this coat is light brown. The cells are rectangular and fairly regular in arrangement. They differ from the corresponding element of stavesacre in that they are larger and more irregular. They differ from the outer layer in color, shape and in that their walls are not convoluted.

The preceding descriptions have applied only to larkspur; and now we turn to stavesacre. The outer layer of the coat of stavesacre is very characteristic. It is the most important element in the recognition of this seed. In size these cells are larger than those of the other layers of the seed coat. The cells of this coat when seen in powder are lighter in color than those of the outer coat of larkspur, but the chief difference is that their walls are straight and not convoluted as are those of larkspur. The wall is very thick and the cell cavity is lighter in color than the cell wall. The outer surface of these cells is covered with trichomes of the unicellular variety and having a large cavity. This is another difference

between the two seeds, as larkspur has only rudimentary trichomes or papillæ.

The middle layer of the coat of stavesacre is very similar in shape of cell to the outer coat of larkspur, the cells having the same convoluted walls. The difference is that the cell of stavesacre is white and somewhat larger than that of larkspur which is dark brown. This difference can be used to advantage in distinguishing between the two.

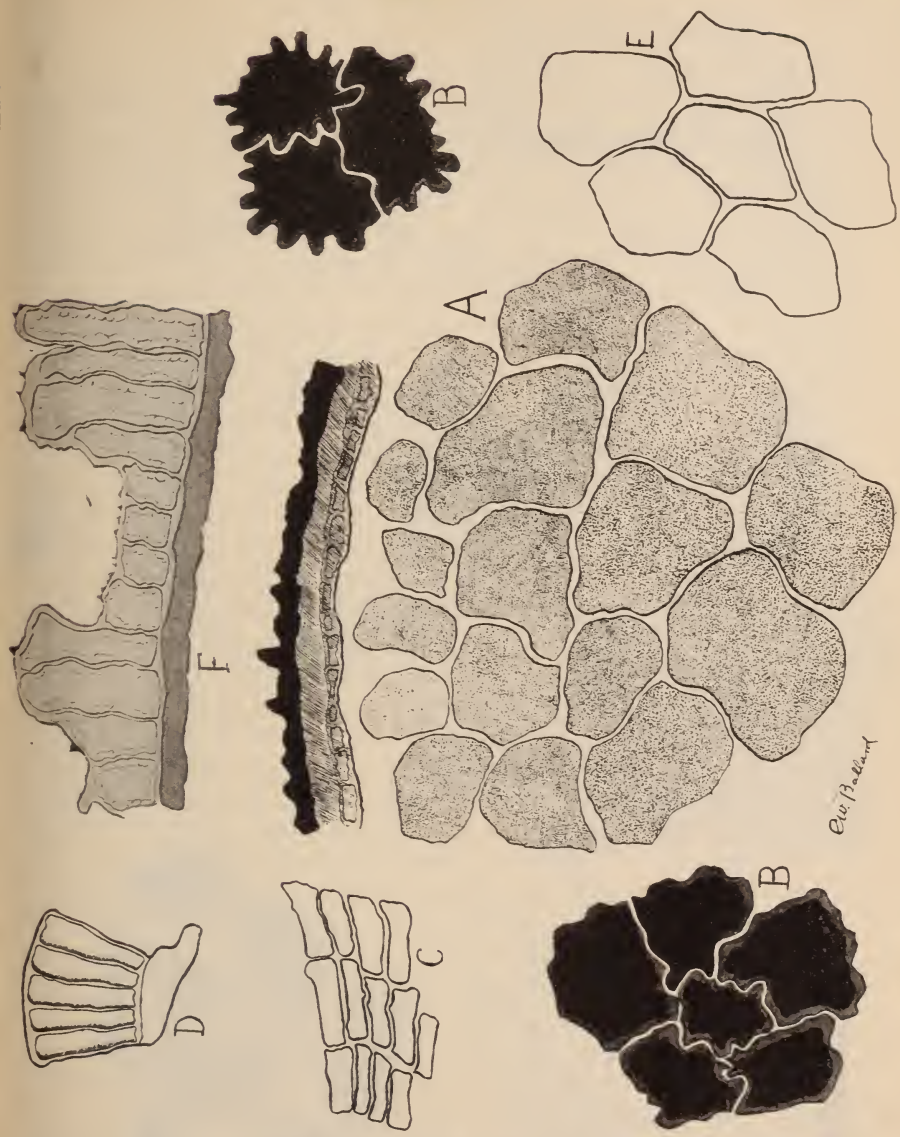
The inner layer of the seed coat of stavesacre resembles somewhat the corresponding layer of larkspur. The cells are rectangular in shape, brown in color and thin-walled. The walls appear to be crossed by fine lines or striations, giving them the appearance of being indefinite in outline. These cells are smaller, darker in color and more symmetrically arranged than those of larkspur. They are usually seen on surface view in the powder while those of larkspur are more often seen on side view.

We may summarize the above as follows:

Larkspur—Outer layer, cells dark in color with convoluted walls. Middle layer, white thin-walled polygonal cells. Inner layer, dark brown, rectangular cells, much longer than broad and larger than the corresponding cells of stavesacre.

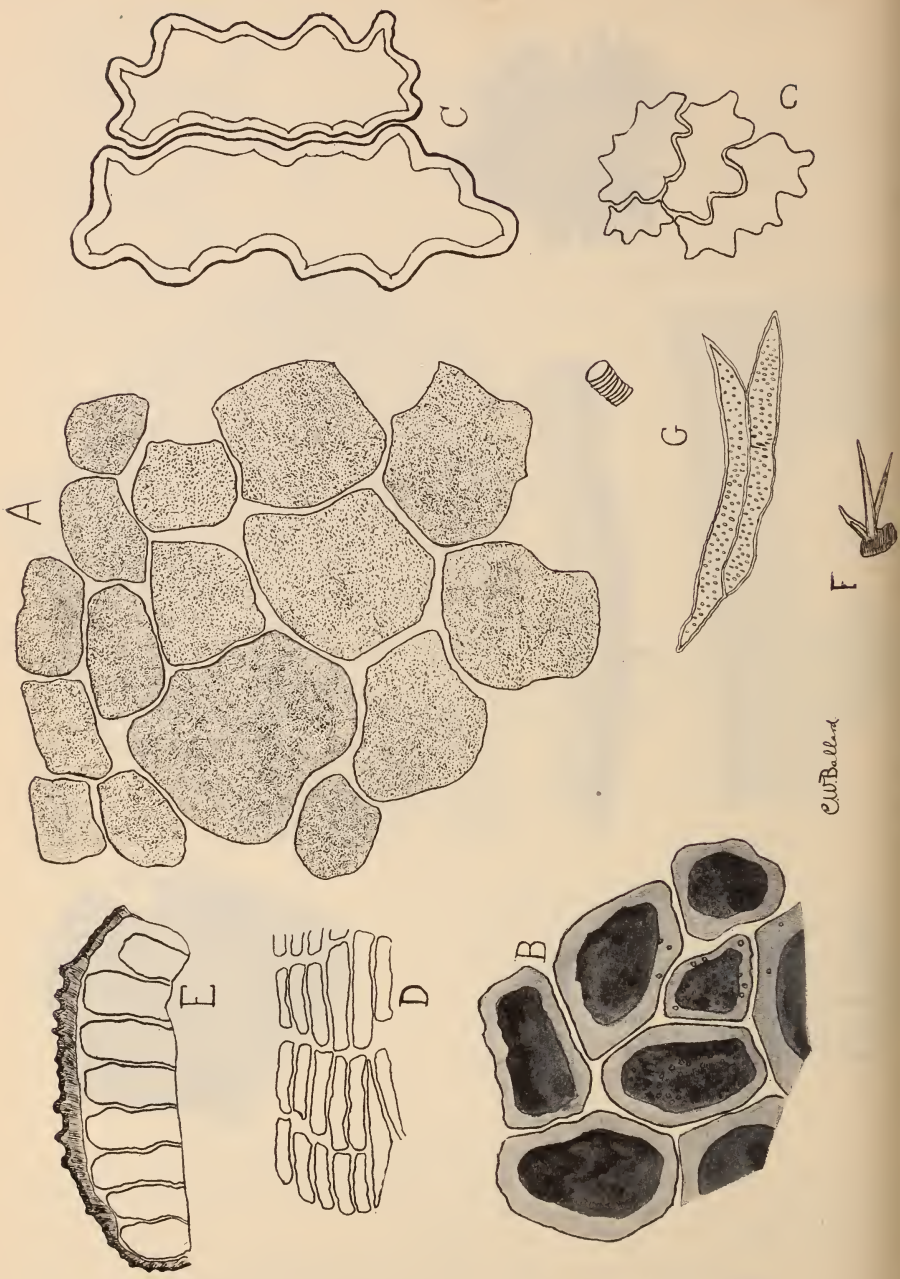
Stavesacre—Outer layer, dark brown polygonal cells with thick, straight walls. Middle layer, large white cells with convoluted walls. Inner layer, brown rectangular cells, smaller than those of larkspur.

Columbia University, New York College of Pharmacy.



SECTIONAL VIEW OF DELPHINIUM CONSOLIDA; LARKSPUR SEED.

A. Section of Seed Showing the Three Layers of Seed Coat and the Large Endosperm Cells.
B. Convoluted Cells of Outer Layer of Seed Coat.
C. Surface View of Cells of Inner Layer of Seed Coat.
D. Side View of Cells of the Inner Layer of Seed Coat; Palisade Cells.
E. Tissue of Middle Layer of Seed Coat.
F. Outer Layer of Seed Coat Showing Characteristic Schlerenchymatic Tissue.



SECTIONAL VIEW OF DELPHINIUM STAPHISAGRIA; STAVESACRE SEED.

A. Endosperm Cells Filled with Aleurone.
B. Thick-Walled Cells of the Outer Layer of the Seed Coat.
C. Convoluted Cells of the Middle Layer of the Seed Coat.
D. Surface View of Cells of the Inner Layer of the Seed Coat.
E. Side View of Cells of the Inner Layer of the Seed Coat, Showing the Bases of the Trichomes.
F. Group of Trichomes.
G. Tracheids and Vessels.

RESIN OF PODOPHYLLUM.

BY WILBUR L. SCOVILLE.

In 1889 Messrs. Dymock & Hooper called the attention of British pharmacists * to the fact that there are two varieties of podophyllum in existence, the American species, *Podophyllum peltatum*, and an Indian species grown on the Himalayas and known botanically as *Podophyllum emodi*. They reported that the Indian variety contained 10 to 12 per cent. of resin, and that this resin, in doses of ½ grain, was active, and appeared to be quite equal to resin of *P. peltatum*.

The next year Mr. F. A. Thompson reported † an analysis of a sample of resin of *P. emodi*, giving a content of podophyllotoxin as 13.1 per cent. and of podophyllotoxic acid as 56.55 per cent. Mr. Thompson concluded from his investigation that *P. emodi* is probably 2½ times as valuable a remedy as *P. peltatum*, on account of its larger content of active resin.

In 1892 Mr. J. C. Umney reported ‡ an analysis of a sample of *P. emodi* resin in which he found 16.8 per cent. of podophyllotoxin and 2.6 per cent. of picropodophyllin, and quotes an analysis of *P. peltatum* resin by Prof. Podwissotzki which yielded 33.8 per cent. of podophyllotoxin and 4.5 per cent. of picropodophyllin.

Mr. Umney estimated the podophyllotoxin by pouring a chloroform-ether solution of the resin into benzin, while Podwissotzki estimated it by pouring a chloroform solution into benzin. Mr. Umney found only 2.6 per cent. of his resin soluble in benzin, hence the latter will precipitate everything except what the ether and chloroform may hold in solution, and the amount of precipitate will depend entirely upon proportions and conditions. This method of estimating podophyllotoxin is now known to be of no value whatever, but at the time of Mr. Umney's work this was the only method that had been disclosed.

Based on this faulty estimation, and without any physiological tests, Mr. Umney concludes that "the value of *Podophyllum emodi*, dependent upon the larger amount of resin present in the drug, is counterbalanced by the smaller proportion of the active ingredient present in it."

Mr. Umney's standing in England apparently led to a general adoption of his conclusions, although he had made at this time no confirmatory tests. A few weeks later, in reply to a protest by Mr. Hooper, he states § that *Podophyllum emodi* resin was given to "eleven adult males" in doses of "as much as ½ grain each" without marked cathartic action "*except in one instance*." He further stated that two manufacturers had found the *P. emodi* resin inferior therapeutically to that of *P. peltatum*.

* Phar. Journal & Trans., 1889, 585.

† Amer. Journal Pharm., 1890, 245.

‡ Phar. Journal & Trans., 1892, 207.

§ Phar. Journal & Trans., 1892, 440.

Contrary to this, Drs. H. W. G. MacKenzie and W. E. Dixon stated in 1898 * that they found as the result of a series of tests that "*P. emodi* is nearly twice as effective physiologically as *P. peltatum*."

In 1898 Prof. W. R. Dunstan and Mr. T. A. Henry presented † an exhaustive paper to the (English) Chemical Society entitled, "A Chemical Investigation of the Constituents of Indian and American Podophyllum (Podophyllum emodi and Podophyllum peltatum)."

This work was an amplification of the chemical work of Prof. Podwissotzki (1881) and of Kursten (1891), and included an investigation of the Indian drug, which the first investigators did not examine. Dunstan and Henry show that the resins of both varieties contain identical constituents, but that these constituents are found in different proportions. They find that podophyllotoxin is active, that it exists in about twice as large proportion in *P. emodi* as in *P. peltatum*, and they also find an active resinous body in each variety, from which they conclude that podophyllotoxin is not the only active constituent. They further state that the two resins "differ comparatively little in physiological activity."

In 1900 *Podophyllum emodi* was admitted to the Indian and Colonial Addendum of the British Pharmacopœia, thus making it an official drug, at least in India. Under the title "Podophylli Indici Rhizoma" it is described as containing "10 to 12 per cent. of resin, consisting of quercitin, podophyllotoxin and podophylloresin, the podophyllotoxin being present in much larger proportion than in ordinary podophyllum resin." It is further described as "An equivalent of American podophyllum rhizome."

Despite the work of Dunstan and Henry and of Mackenzie and Dixon, and the adoption of the Indian drug by the British Pharmacopœia, the relative values of the two varieties of podophyllum continue to be questioned.

The editor of the "Pharmaceutical Journal," the editor of the "British Year-Book," Mr. D. B. Dott and others have maintained the position that the resin of *P. emodi* is inferior, but evidence to support this is meagre or lacking. General statements, such as "some manufacturers report," a "trial on three persons," etc., appear to suffice for the formation of opinions on the subject. It is very noticeable that in the cases where thorough and scientific investigations have been made, the preponderance of evidence is in favor of *P. emodi*, being at least equal to *P. peltatum*, while in lay investigation, in which scientific accuracy seems improbable, the bulk of evidence is on the other side.

Probably the fact that no class of drugs offers more obstacles to accurate physiological testing than the cathartics will largely explain these differences in conclusions.

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* Edinburgh Med. Journal, Nov., 1898.

† Journal of the Chemical Society, 1898, 209.

Two facts have been established concerning the two varieties. First, that the rhizome of *P. emodi* yields two to three times as much resin as the rhizome of *P. peltatum*, and second, that the resin of *P. emodi* contains probably twice or more as much podophyllotoxin as that of *P. peltatum*.

The larger yield of resin in the Indian drug offers a strong temptation to use it, provided one's conscience, personal opinions or principles will allow of it. And it is undoubtedly true that the resin of *P. emodi* is sold in the American market, and is sometimes labeled "Resin of Podophyllum, U. S. P." That this is reprehensible cannot be questioned, but it is nevertheless highly desirable that the truth should be established concerning the value of the Indian drug.

The author was first asked to find some method of distinguishing between the two resins which could be depended upon. This led to further investigations which, while disclosing no new facts of importance, may yet be of interest.

With regard to a distinguishing test, the color of the solution is sufficient. While it is undoubtedly true that the color of the resin, as it appears on the market, may be varied by details in precipitation, drying, etc., so that the color in the dry form is of little or no value, in solution each has a distinctive color. The resin of *P. peltatum* gives solutions of a reddish-brown color, while those of *P. emodi* have a marked olive-green tint, with but traces of brown, and this is especially marked in benzene and chloroform solutions. Both resins are entirely soluble in methyl, ethyl, butyl, and amyl alcohols, in ethyl and amyl acetates, and in acetone and pyridine. Benzoyl chloride forms a compound with each.

The following table gives the percentage of resin of each variety which was found to be soluble in the respective solvents, with the observed melting-points of the soluble portions. The resin of *P. peltatum* lost 3.215 per cent. on drying at 100° C., and that of *P. emodi* 3.25 per cent.

Solvent.	P. peltatum Resin.	P. emodi Resin.
Ethyl alcohol	99.5%	98.01%
Petroleum ether....	2.41%	1.94%
Carbon tetrachloride.	8.12%, melting-point 114–133	6.85%, melting-point, 168
Carbon disulphide ..	12.65%, melting-point 40–63	6.95%, melting-point, 40–46
Benzene.....	25.57%, melting-point 80–129	23.60%, melting-point, 80–118
Toluene.....	32.40%, melting-point 70–103	18.50%, melting-point, 75–103
Chloroform	70.60%, melting-point 86–120	76.90%, melting-point, 92–120
Ether	89.00%	83.72%

The melting-points in all of the above simply indicate that each solvent extracts a mixture of bodies, and that a separation of the constituents by this method is impracticable. Petroleum ether is said to extract mainly fat, and benzol appears to extract the coloring matters more quickly than the other partial solvents. Carbon disulphide solution contains a considerable proportion of soft resin.

The constituents of each variety of resin as stated by Dunstan and Henry are:

(1) Quercitin, the coloring matter which they find more abundant in *P. emodi* than in *P. peltatum*.

(2) A soft resin which they found to be physiologically active.

(3) Podophyllotoxin, a crystalline body which has been accepted as the main active constituent.

On treatment with alkalis, podophyllotoxin is converted into podophyllic acid which combines with the base, and on heating picropodophyllin is formed, which is isomeric with podophyllotoxin, and is the lactone or anhydride of podophyllic acid.

Whether picropodophyllin and podophyllic acid exist in the resin is uncertain, but probably they are there in very small proportions if at all. MacKenzie & Dixon state that they are not found in the drug.

Methods for the assay of podophyllum and its resin have been proposed, which are based on this action of podophyllotoxin with alkalis.

Dunstan & Henry's method * consists in mixing the resin with half its weight of calcium hydroxide, wetting the mixture with absolute alcohol and evaporating to dryness. The treatment with alcohol and drying is repeated several times, then the dry mixture is extracted with alcohol, the alcohol evaporated, and the dry residue is weighed as picropodophyllin. This last being isomeric with podophyllotoxin corresponds in weight to the latter, and hence represents the proportion of podophyllotoxin in the resin.

Gordin & Merrell † have modified this process in the following way: The resin is mixed with calcium hydroxide, and enough of a mixture of alcohol and chloroform is added just sufficient to render the mixture semi-fluid, then it is heated in a stout and stoppered bottle to 60° C. for 6 hours, shaking every 15 minutes. The mixture is then cooled, more alcohol-chloroform added, shaken thoroughly, and set aside for one to several days to settle. An aliquot portion of the clear fluid is then decanted, evaporated to dryness and weighed as picropodophyllin.

Both methods were tried with the following results: Gordin-Merrell method yielded 24.04 and 25.7 per cent. from *P. peltatum* resin, 63.2 and 62.7 per cent. from *P. emodi* resin. In both cases the residue was quite

* Jour. Chem. Soc., 1898, 224.

† Proc. Amer. Phar. Assoc., 1903.

colored, and not entirely soluble in chloroform, about 15 per cent. of the residue being insoluble in either hot or cold chloroform. Both residues failed to give a sharp melting-point, that from *P. peltatum* softening at 178° C. and from *P. emodi* at 189°C. Since picropodophyllin melts at 227° C., the residue which is weighed as pure picropodophyllin is evidently far from a pure body.

By Dunstan & Henry's method, modified by extracting with chloroform instead of alcohol, was obtained 25.6 per cent. of podophyllotoxin from *P. peltatum* resin, and 51.7 per cent. from *P. emodi* resin. These residues were also colored and had indefinite melting-points: 134–162° C. and 189–201° C. respectively. An attempt to assay a chloroformic extract of the resin only by Dunstan & Henry's method met with an accident after three weeks of operation and was not again attempted, since the appearance of the final solution did not offer encouragement for further trials. Both methods are tedious to operate, and the results as I obtained them were far from satisfactory.

Dunstan & Henry found about 20 per cent. of podophyllotoxin in the resin of *P. peltatum* and about 38 per cent. in the resin of *P. emodi*.

It is apparent that by the best methods of estimation at present known the resin from the Indian drug contains about twice as much podophyllotoxin as that from the American rhizome.

Some pure podophyllotoxin was then separated from each resin for comparison. On dissolving the resin in chloroform and pouring the chloroformic solution into twenty times its volume of petroleum ether (which was the method proposed by Kremel and used by Umney as the basis of his judgment concerning the relative value of the two resins), it was noticed that the resins are precipitated more easily and completely than the podophyllotoxin by the petroleum ether. The greater portions of the resins and coloring matter were separated by fractional precipitation in this way, the first precipitate being rejected and the second reprecipitated several times.

Finally a pure product was obtained by fractional crystallization from benzol solutions. In this way about 3 Gm. of pure white podophyllotoxin was obtained from 100 Gm. of resin of *P. peltatum*, and about 16 Gm. having a faint green tint from the resin of *P. emodi*.

The first melted sharply at 117° C. and the second at 117.5° C., showing that both are practically pure products. There is a large loss in purifying, yet the greater yield obtained from the Indian resin is confirmatory of the conclusions reached by the assay processes.

These pure podophyllotoxins are now being tested for relative toxicity and activity, and will probably be reported upon in a separate paper by Dr. Houghten. Previous trials by physiological methods of the two resins had failed to show any marked difference in their activity.

THE CONDENSATION OF CHLORAL WITH PRIMARY AROMATIC AMINES.

BY ALVIN S. WHEELER AND S. JORDAN.

This is a continuation of work described by one of us (Wheeler, Jour. Amer. Chem. Soc., 24, 1063, and 30, 136). In the latter paper it was stated that the product of the condensation of chloral and o-toluidine possessed physiological properties. It will undoubtedly be found true that all of these new compounds have a physiological action. We stand ready to furnish the material to any one who is in a position to make the necessary experiments. A description of the following compounds will shortly be published. Trichlorethylidenedi-m-bromphenamine, white needles, melt at 115°–116° C. Trichlorethylidenedi-p-aminobenzoic acid, crystalline masses, melt at 215°–220° C. Trichlorethylidenedi-m-aminobenzoic acid, colorless crystals, melt at 240° C. with decomposition. Trichlorethylidenedi-o-nitro-p-tolamine, colorless crystals, melt at 108°–109°C. Chloral-2-nitro-4-toluidine, yellow needles, melt at 187°–188° C. Trichlorethylidenedi-p-nitro-o-tolamine, long golden-yellow needles, melt at 142°–143° C. Trichlorethylidenedi-m-nitro-p-tolamine, brownish-yellow needles, melt at 165°–166° C. Trichlorethylidenedi-m-chlor-p-tolamine, long silvery white needles, melt at 110° C. Chloral-m-chlor-p-toluidine, silvery white needles, melt at 182°–183° C. Trichlorethylidenedi-p-brom-o-nitrophenamine, small lemon-yellow needles, melt at 190°–191° C. Trichlorethylidenedi-p-brom-m-nitrophenamine, yellow needles, melt at 147°–148° C. Trichlorethylidenedi-p-iodophenamine, gray branching needles, melt at 123° C. Trichlorethylidenedi-4-brom-1-naphthylamine, violet powder, decomposing without melting. Trichlorethylidenedi-p-aminoacetophenone, thin rectangular plates, melt at 162° C.

University of North Carolina.

GELSEMINE HYDROCHLORIDE AND GELSEMININE.

BY L. E. SAYRE.

As one interested in the Scientific Section of the American Pharmaceutical Association, it is my desire to keep up the interest in gelsemium and its alkaloids, and to this end I beg leave to report further work upon the drug during the past year, although there is very little of progress to report.

Through the courtesy and kindness of the Chairman of this Section, Mr. Charles E. Vanderkleed, an extraction of fifty pounds of gelsemium has been made at the laboratory of H. K. Mulford Company. The extraction was accomplished by the use of solvents mentioned at the last annual meeting (see Proceedings American Pharmaceutical Association, 1908, page 852), and these solvents were used in about the same order.

A few points concerning this preliminary work, just completed, may be of interest, leaving for next year the careful analysis and purification of the finished products. It should be said that the object this year has been

to obtain a sufficient quantity of the alkaloids, so that their careful examination (physiological and chemical) would be possible. As before stated, I am wholly indebted to the Chairman of this Section for the details of the present work. The points in connection with it, that are worthy of record, are as follows :

1. Yield of extract : 50 pounds of gelsemium, first exhausted with gasoline, repacked and exhausted with 95 per cent. alcohol and evaporated in high vacuum, yielded 9¾ pounds of soft extract. This soft extract, after standing over two months in a closed can, deposited a considerable quantity of crystals, which proved to be nearly pure sugar, containing traces of chlorides of calcium and magnesium.

2. Gelsemic acid : A portion of the above extract (¼ portion) was treated with 2 per cent H_2SO_4 and the acid solution thoroughly washed with chloroform. The chloroformic solution yielded groups of crystals of gelsemic acid of a dark brownish-yellow color. The acid solution, when shaken with ether-chloroform (5 to 1) until exhausted, and the separated etherial liquid washed with 2 per cent. HCl, gave no crystals on careful evaporation of the latter acid liquid—even on long standing. The concentrated acid liquid was evaporated in vacuo, then evaporated nearly to dryness. The residue consisted mostly of gelseminine chloride, uncrystalline.

3. A second portion of the extract (¼) was similarly treated with all the solvents, and in the same order. The extract, however, was first treated with an equal bulk of lime and dried. The final acidulated (HCl) aqueous washings of the ether-chloroform solution of the alkaloids, gave on evaporation no crystals, but on concentrating to dryness and treating the residue with alcohol, an insoluble residue was left behind (2.1 Gm.) of gelsemine chloride. The alcoholic solution on evaporation gave the same uncrystalline residue of gelseminine chloride, as before. It was a soft, gummy mass.

4. The large portion (½) was extracted with benzene after making ammoniacal with 26 per cent. ammonia, the benzene solution was filtered and shaken out with 2 per cent. H_2SO_4. The acid solution was thoroughly washed with chloroform to remove gelsemic acid. The acid solution was made ammoniacal with 26 per cent. ammonia and shaken out with ether-chloroform. The ether-chloroform solution was shaken with acidulated (HCl) water. The acid solution was then concentrated in vacuum to small volume and set aside to crystallize. Considerable crystals separated, which after washing with U. S. P. alcohol and drying in vacuum desiccator for two days, weighed 11.5 Gm. gelsemine hydrochloride.

The alcoholic solution was set aside to crystallize after concentration ; no crystals were obtained. Residue, gelseminine chloride.

The above products will be further studied during the coming year.

SUPPLEMENTARY NOTE ON LIQUOR POTASSII ARSENITIS.

BY A. B. LYONS.

Last year I reported on the observation that solutions of potassium arsenite (Fowler's Solution) became gradually oxidized under ordinary conditions. At the end of eleven months I have examined again the same samples which had been kept meanwhile, in cork stoppered one-ounce bottles, about half filled, and find, as might have been expected, that oxidation has gone on slowly in nearly all of them. The rate of oxidation has been most rapid, in general, in those samples which last year showed the most oxidation. It is noticeable that the samples which showed strong effervescence on addition of acid, as a rule, have oxidized less rapidly than the others. Some of those that were deficient in alkali have shown quite rapid oxidation, the alkali in these cases being caustic, or not strongly carbonated, but the reasons why one sample is more susceptible than another to oxidation are not fully elucidated by this series of observations.

The solutions of potassium arsenite prepared a year ago, with additions of acid and alkali were re-examined. Those containing free acid have not undergone appreciable oxidation. That containing sodium bicarbonate was oxidized very slightly, showing, however, distinctly the presence of arsenate. The sample rendered alkaline with potassium hydroxide oxidized as rapidly as the more susceptible samples of Fowler's Solution. It is plain that alkalinity favors oxidation, and hence that Fowler's Solution should be made neutral or distinctly acid, if it is to be permanent.

The cause of the exceedingly rapid oxidation of sample 14 does not however, appear. The solution contained at first a little hydrated alkali, but there was added at the time it was prepared, a somewhat large amount of sodium bicarbonate so that no caustic alkali could have been present: All the samples had been kept under similar conditions—in cork stoppered four-ounce bottles, about half filled.

Another series of experiments is in order, in which varying amounts of different alkalies should be added to the solutions.

OBSERVATIONS OF SAMPLES OF LIQUOR POTASSII ARSENITIS.*

Number of Sample.	Per Cent. As_2O_3 Oxidized When Examined 1908.	Per Cent. As_2O_3 Additional Oxidized Since First Examined.
1	0.000	0.005
2	0.014	0.013
3	0.017	0.019
4	0.022	0.017
5	0.011	0.001
6	0.006	0.006

* See Proceedings American Pharmaceutical Association, Vol. 56, p. 905.

7	0.015	0.015
8	0.012	0.021
9	0.015	0.001
10	0.017	0.025
11	0.021	0.000
12	0.004	0.001
13	0.019	0.040
14	0.344	0.235

OXIDATION OF ACID AND ALKALINE SOLUTIONS OF POTASSIUM ARSENITE.

	Per cent. As_2O_3 by Titration, Aug., 1908.	Per cent. As_2O_3 by Titration, July, 1909.	Per cent. of Total As_2O_3 Oxidized in 11 months.
1 per cent. solution containing HCl	1.00	1.00	0.01
1 per cent. solution containing H_2SO_4	1.00	1.00	0.01
1 per cent. solution containing Na_2HCO_3	1.00	0.995	0.5
1 per cent. solution containing KOH	1.00	0.975	2.5

ELIXIR OF LACTATED PEPSIN.

BY W. A. PEARSON.

The popularity of elixir of lactated pepsin cannot be questioned. It is the adjuvant of thousands of prescriptions besides being frequently prescribed alone.

Its therapeutic virtues have been often lauded by clinicians who have claimed marked beneficial results, although the solution contains both proteolytic and amylolytic enzymes. We have long been taught, as pharmacists, to regard this as a distinct incompatibilty, and also, that the presence of alcohol was decidedly detrimental to these enzymes.

As excellent clinical results have continued to be reported, as is manifested by the tremendous sale of this preparation, pharmacists have busied themselves in supplying the demand, not in trying to explain the marked discrepancy between clinical observations and laboratory results.

Repeated trials by chemists to find amolytic activity have resulted in failure. Personally, I have tried digestions in several concentrations at many temperatures, and under various degrees of acidity and alkalinity without any more action than the corresponding blank experiment under the same conditions.

The failure to demonstrate any diastatic activity by methods usually used in the laboratory, does not hinder the physician prescribing the preparation, for he says that the condition under which diastatic action takes place is widely different than making the digestion in a glass flask with impermeable walls. The stomach and intestines, being membranous, allow the elimination, by dialysis, of the soluble digestion products which may retard the amylolytic digestion in a glass flask.

Digestion experiments were made with perfectly fresh hog bladders

(previously washed out with distilled water). They were suspended in physiological salt solution (0.65 per cent. sodium chloride) and 100 Cc. of a 2 per cent. starch paste added and digested at body temperature (37° C.), and in every case no noticeable diastatic action took place even after three hours.

These experiments seem to disprove that dialysis is the cause of the seeming discrepancy between therapeutic results and laboratory experiment. The clinicians can now say that in the stomach other conditions are present which account for the beneficial results of elixir of lactated pepsin. This is a hard statement to prove or disprove, and probably the problem will rest here sometime before the processes of digestion are sufficiently well understood to determine whether or not such a preparation as elixir of lactated pepsin aids amylolytic digestion.

From my own limited experiments on this point, I can only say that so far I have been unable to prove that any increased amylolytic digestion takes place in the presence of elixir of lactated pepsin.

The stomachs of guinea pigs were extirpated immediately after death and suspended in physiological salt solution at 37° C., and one cubic centimeter of two per cent. starch paste introduced both with and without elixir of lactated pepsin, and in *both* cases amylolytic digestion took place. These experiments have been repeated with similar results.

In the case of extirpation of the first and second stomach of a wild rat immediately after death under the same conditions, I found little or no amylolytic digestion in the first stomach, but a marked one in the second.

Two hogs' stomachs were obtained soon after death of the animals and were washed out with distilled water. In one, 100 Cc. of 2 per cent. starch paste was added; in the other, 100 Cc. of 2 per cent. starch paste with 10 Cc. of elixir of lactated pepsin 40 grains. Both were suspended in physiological salt solution at 37° C. for three hours, during which time they were gently stirred every ten minutes. After digestion the fluid was separated and tested for starch. No blue coloration appeared, but the characteristic dextrin reaction was seen in both.

While these experiments do not indicate that elixir of lactated pepsin hinders amylolytic digestion, further experiments are necessary to show that it increases the transformation. As soon as the amount of starch paste is found that is not quite all capable of being acted upon in the extirpated stomach by the enzymes already present, then we may intelligently add elixir of lactated pepsin and determine if it is capable of acting upon the excess.

Several different formulæ have been given for elixir of lactated pepsin; the National Formulary directs that the diastase used is to be the *best* commercial variety capable of converting the largest amount of starch into dextrin and glucose. This leaves the question open for discussion as to which brand is to be used.

As long as analytical chemists cannot tell whether or not any amylolytic enzymes at all have been added, it is reasonable to believe that none but the most reliable and conscientious of manufacturers are going to add diastase having the highest converting power and commanding the highest price. In fact, it would not be unreasonable to believe that some unscrupulous manufacturers may use the cheapest, and perhaps also omit the pancreatin as well.

While there is no one formula in general use, reputable manufacturers list elixir of lactated pepsin 40 grain and elixir of lactated pepsin 80 grain, meaning that these represent respectively 40 and 80 grains of lactated pepsin in each fluidounce. But there is no definite standard for lactated pepsin, hence many arbitrary standards are in vogue.

Presumably, lactated pepsin is pepsin with lactic acid, but the proportions of each are not specified in standard pharmaceutical works. Out of this choas come myriads of preparations known commercially as elixir of lactated pepsin.

Samples I have examined have varied from 7.2 per cent. to 17 per cent. of alcohol. This fact in itself is significant of the widely different prices asked for this preparation. Digestion tests made to determine the proteolytic activity have varied to an equally wide degree. Samples examined have shown by digestion tests to contain only one-eighth the amount of pepsin expected.

For the sake of easily comparing results, the U. S. P. method of assay was followed, using 10 Gm. of egg albumen and adding directly to the suspension various amounts, from 0.1 to 5 Cc. of the sample to be tested, and weighing the moist undigested albumin at the end of the experiment after collecting on cheese cloth and washing with 100 Cc. of water and allowing to drain for ten minutes.

It is well known that alcohol will destroy or inhibit the proteolytic activity of pepsin, and if I may summarize without presenting tedious analytic details, will state that the amount of pepsin indicated by digestion experiments on an elixir prepared a few weeks and containing 15 per cent. of alcohol, is only about one-half as great as would be expected from the amount of pepsin known to have been originally added.

From the great variation found in the commercial samples of elixir of lactated pepsin examined, it is to be wondered at that clinicians obtain uniform results with its use.

The term "lactated pepsin" should be defined, and some method devised to value the amylolytic ferments that may be present.

THE NEW ALCOHOL TABLES OF THE U. S. BUREAU OF STANDARDS.

BY A. B. LYONS.

It occurred to me not long since, to make a practical test of the correctness of the several alcohol tables given in various late Pharmacopœias. I

made a number of mixtures of official alcohol, of known specific gravity, with recently boiled distilled water and determined the specific gravities of the several mixtures. I took out then from the several alcohol tables the percentage of alcohol in the mixtures and compared this with the percentage known to be present. Two facts became at once evident:

First. The several tables, with one exception, showed a substantial agreement, differences in most cases being less than 0.1 per cent. The exception is the table in the new French Codex, which is stated to have the authority of the "National Bureau of Weights and Measures." * One may conclude that the authorities generally have followed Mendeléef, the Codex excepted. Whether the latter has followed Guy-Lussac, or is based on an independent research, I am not in position to say.

Second. The percentages taken from the common tables in case of mixtures containing fifteen to thirty-five per cent. by volume, of alcohol, were too high. I had taken the specific gravities of the mixtures within a few hours after they were made, and at room temperature, reducing to standard temperature by calculation. On attempting a few days later to verify my weighings, I found that the mixtures containing 15 per cent. to 35 per cent. had gained notably in specify gravity. I was inclined to believe that this was due to loss of alcohol, particularly as I observed that several successive weighings of the same sample, which had meantime been poured from one container to another and stirred to equalize temperature, showed progressive increase in weight. In case of weaker or stronger mixtures, no such rapid change was noted, tending to show that loss of alcoholic strength was not the true explanation of the increase in specific gravity. I had observed years ago, that an alcoholic distillate containing 20–25 per cent. alcohol showed a higher specific gravity after twenty-four hours than immediately after distillation. The conclusion seems to be that the old notion that when alcohol and water are mixed, the maximum condensation is not reached at once, is true. It will be remembered that Gilpin's mixtures of alcohol and water were kept a month before their specific gravity was taken, and that Mendeléef adopted Gilpin's results substantially for alcoholic mixtures containing less than 35 per cent. by weight of alcohol.

It is easy to understand discrepancies in the results of different observers, if condensation is a gradual, not an instantaneous process. It is easy also to see how different persons, working with the same apparatus may report differently on the strength of an alcoholic preparation, according to the length of time allowed to elapse before taking the specific

* This authority is claimed only for the figures for specific gravity, and in these there are apparently no errors. Four important errors, however, occur in the figures for per cent. by weights, viz: in those corresponding with 6, 10, 44 and 58 per cent. respectively. These should read 4.807, 8.052, 36.971 and 50.195, instead of 4.812, 8.042, 36.905 and 50.313.

gravity of the distillate. The differences, according to my observation, may amount to as much as 0.25 per cent.

It was with much satisfaction that I learned that the Bureau of Standards had caused to be prepared new alcohol tables, which may be accepted as authoritative. I procured copies of these at once, and have examined them figure by figure, looking in vain for misprints or serious errors in computation.

There are five of the tables. The first gives the density at 15°, 20° and 25° C. of mixtures of alcohol and water for integral percentages (by weight) from 0 to 100 per cent., the standard of comparison being, of course, water of maximum density, and vacuum weighing being also, of course, presupposed. The temperatures are those of the hydrogen thermometer, this being what is now adopted as the basis for certification, even of mercurial thermometers. The ultimate figures of Mendeléef's table are adopted with corrections made necessary by faulty figures in that table for the density of water at the several temperatures considered. The figures for 25° C. had to be supplied by interpolation, Mendeléef's tables giving figures only for 0°, 10°, 15°, 20° and 30° C.

On referring back to Mendeléef's paper, I find that after making numerous very careful determinations of the density of mixtures of exactly known strength, Mendeléef finally modifies the figures thus empirically obtained to conform to a complicated mathematical formula by which he endeavors to cover the entire range of the table. Furthermore, his own experimental work is devoted almost wholly to mixtures containing more than 35 per cent. of alcohol. For mixtures containing less than this, he is content to adopt the much older figures of Gilpin, modified by application of his formula. I confess that I am not mathematician enough to judge as to the value of Mendeléef's formula. Personally, I should incline to give greater weight to experimental results, particularly if one can be assured that in these the maximum of condensation has been reached.

The second table gives the density at 20° C. of mixtures of alcohol and water for each 0.1 per cent. from 0 per cent. to 100 per cent. This is well enough, but in this country we are accustomed to reckon alcoholic strength in volume percentages, so that this table, if used, must be supplemented by another to convert weight to volume percentages, and such a table is included in this series. Of course, 20° C. is a more convenient temperature than 15° C. (60° F.), particularly for use of the pycnometer, but 25° C., the standard adopted by the U. S. P. VIII, is much preferable, and we can only regret that the table was not calculated for that temperature. One reason, no doubt, was that in case of very weak spirit, the coefficient of expansion is notably higher at 25° than at 20° C., and hence experimental errors would be greater at the former temperature. This would not be true, however, in case of spirit of more than 35 per cent. Another possible reason might be that the figures for 20° C. were origin-

ally obtained by direct experiment, those at 25° C. only by interpolation, hence the former are a little more authoritative.

The third table is that which will be used the most. It gives the specific gravity (in vacuo) at 60° F. $\left(\frac{60° \text{ F.}}{60° \text{ F.}}\right)$ of mixtures of alcohol and water for each 0.1 per cent. from 0 per cent. to 100 per cent. In using the table, it is necessary to correct the weighing by adding the apparent weight of the displaced air. This correction, under average conditions of air pressure, will be :

For specific gravity between				1.000	and 0.943	+ 0.00106
"	"	"	"	0.943	" 0.873	+ 0.00107
"	"	"	"	0.874	" 0.803	+ 0.00108
"	"	"	"	0.804	" 0.733	+ 0.00109

The pycnometer must hold of distilled water, weighed in air, instead of 10.0000 parts, 9.9894 parts. If it hold more or less than this, the "error of the bottle" must be treated in the usual way. Thus, suppose the bottle, accurately counterpoised, is filled with distilled water and found to contain at 60° F. 9.9885 parts. Its "error" is 9.9894 — 9.9885 = 0.0009 parts additive. A sample of spirit is found to weigh at 60° F. 9.0537 in air. Add for error of bottle .0009 × 0.90537 = .0008, also add for weight of displaced air 0.0107. This will give 0.90537 + .00008 + .00107 = 0.90652. The nearest figure in the table is 0.90653, corresponding with 63.1 per cent. alcohol.

It is to be regretted that the inconvenient standard temperature of 60° F. was not exchanged for that universally accepted everywhere except in English-speaking countries, viz., 15° C. (59° F.). The difference is so small that it is a negligible quantity in practice, yet sufficient to give rise to endless misunderstandings in commercial transactions. It results from an Anglo-Saxon habit that is likely to stand in the way of American commercial interests in the wide world—the same that makes us adhere to our irrational and provincial system of weights and measures. Of course, the ratio of weight percentages to volume percentages will be slightly different at 60° F. from what it is at 59° F., and so American and English alcoholmeters will never exactly agree with those of other countries.

Table IV. gives for each 0.1 per cent. the volume percentage corresponding to any given per cent. by weight. It is this table that must be used in connection with Table II to obtain at 20° C. volume percentages. The method of using the table is obvious enough, but the mathematical calculation involved takes time, and the object of such tables is to economize time. Suppose that from Table II. we find that a sample of spirit contains 28.83 per cent. absolute alcohol by weight. By Table IV. we find that 28.7 per cent. by weight corresponds with 34.69 per cent. by volume, while 28.8 per cent. by weight corresponds with 34.80 per cent. by

volume. The desired figure, therefore, lies between 34.69 and 34.80 and it is to be found by adding to the former three-tenths of the difference, or 0.033. Neglecting the last decimal, the result will be $34.69 + 0.03 = 34.72$.

To save the labor of consulting a second table, I have prepared a new table which gives, instead of weight percentages, volume percentages, it being understood that while the specific gravities of this table are to be taken at 20° C., the result obtained is the volume per cent., which, at the standard temperature of 60° F., corresponds with the weight percentage of alcohol. In this table I have adhered exactly to the values accepted by the Bureau of Standards, so that identical results will be reached by using my table with those obtained by using the two tables supplied by the Bureau.

Table V. of the Bureau of Standards is the converse of Table IV., but less elaborate. It gives weight percentages to two decimal places corresponding with integral volume percentages. It would be of use if we wished to construct a table of volume percentages from one giving weight percentages at any temperature, the volume percentage being understood as heretofore, as actually true only at standard temperature.

I have added two tables based on the experimental data of Mendeléfe and of Gilpin as accepted by Mendeléef, one of weignt percentages at 10° C., 15° C., 20° C., 25° C., 30° C., and 15.56° C. (= 60° F.), the other of volume percentages at the same temperatures, the expression "volume percentages" to be understood in the sense already explained. It will be seen that the first of these tables does not quite coincide with Table I. of the Bureau of Standards, or with the more elaborate table of Dr. Morley. Mine may or may not be quite as near correct as its predecessors, from which, indeed, it does not very greatly differ. It results however from a careful analysis of the experimental work of Mendeléef and of Gilpin weaving their results into a self-consistent fabric by methods of interpolation rather than by reliance upon an arbitrary formula.

The second of these tables is based on the first, sharing, therefore, whatever imperfections that may contain. In both tables temperatures are those of the hydrogen thermometer and throughout the standard of comparison is water at maximum density, all weighings assumed to be made in vacuo.

Density of Mixtures of Ethyl Alcohol and Water
At 20°/4° C.

Per cent Alcohol by Volume	Tenths of Per cent.									
	0	1	2	3	4	5	6	7	8	9
0.....	0.99824	809	794	779	764	749	734	719	704	689
1.....	.99674	659	644	630	615	600	585	571	556	541
2.....	.99527	512	498	483	469	455	440	426	412	397
3.....	.99383	369	354	340	326	312	297	283	269	255
4.....	.99241	227	213	199	185	171	157	143	130	116
5.....	.99102	088	075	061	048	035	021	008	*994	*981
6.....	.98968	955	941	928	916	903	889	877	864	851
7.....	.98838	825	812	799	787	774	761	748	735	723
8.....	.98710	697	685	672	660	647	635	622	610	597
9.....	.98585	573	560	548	536	524	511	499	487	475
10.....	.98463	451	439	427	415	404	392	380	368	357
11.....	.98345	333	322	310	299	287	276	264	253	241
12.....	.98230	218	207	195	184	173	161	150	139	127
13.....	.98116	105	093	082	071	060	049	037	026	015
14.....	.98004	*993	*982	*971	*960	*949	*938	*928	*917	*906
15.....	.97895	884	873	862	852	841	830	819	809	798
16.....	.97787	776	766	755	744	733	723	712	701	691
17.....	.97680	669	658	648	637	626	615	604	594	583
18.....	.97572	561	551	540	529	519	508	497	486	476
19.....	.97465	454	444	433	422	412	401	390	379	369
20.....	.97358	347	337	326	315	305	294	283	272	262
21.....	.97251	240	230	219	208	197	186	173	165	154
22.....	.97143	132	121	110	100	089	078	067	056	045
23.....	.97034	023	012	001	*990	*979	*968	*956	*945	*934
24.....	.96923	912	901	889	878	867	856	845	834	822
25.....	.96811	800	788	777	766	755	743	732	721	709
26.....	.96698	687	675	664	652	640	629	617	606	594
27.....	.96582	570	558	547	535	523	511	999	487	475
28.....	.96463	451	439	427	415	403	391	379	566	354
29.....	.96342	330	318	305	293	281	269	256	244	231
30.....	.96219	207	194	182	169	156	144	131	118	106
31.....	.96093	080	067	054	042	029	016	002	*989	*976
32.....	.95963	950	937	923	910	897	884	870	857	843
33.....	.95830	817	803	790	776	763	749	736	722	709
34.....	.95695	681	668	654	640	626	612	598	584	569
35.....	.95555	541	527	512	498	484	469	455	440	426
36.....	.95411	396	382	367	352	338	323	308	293	278
37.....	.95263	248	233	218	203	188	173	158	143	127
38.....	.95112	097	081	066	051	035	020	004	*988	*973
39.....	.94957	941	926	910	895	879	863	847	832	816
40.....	.94800	784	768	752	736	720	703	687	671	654
41.....	.94638	622	605	588	572	555	538	522	505	488
42.....	.94471	454	437	421	404	387	370	353	336	319
43.....	.94302	245	268	251	233	216	199	181	164	147
44.....	.94129	111	094	076	058	041	023	005	*987	*969
45.....	.93951	933	915	897	879	861	842	824	806	787
46.....	.93769	751	732	714	696	677	659	641	622	604
47.....	.93585	566	548	529	511	492	473	455	435	417
48.....	.93398	379	360	341	322	303	284	265	246	227
49.....	.93208	189	169	150	131	111	092	072	053	033
50.....	.93013	*993	*974	*954	*934	*914	*895	*875	*855	*835
51.....	.92815	795	775	755	735	715	695	675	655	634
52.....	.92614	594	574	553	533	513	493	472	452	431
53.....	.92411	391	370	350	329	308	288	267	246	226
54.....	.92205	184	163	142	122	101	080	058	037	016

Density of Mixtures of Ethyl Alcohol and Water
At 20°/4° C.

Per cent Alcohol by Volume	Tenths of Per cent.									
	0	1	2	3	4	5	6	7	8	9
55	0.91995	974	953	932	911	889	868	847	825	804
56	.91783	762	740	719	697	676	654	633	611	590
57	.91568	546	525	503	481	459	438	416	394	372
58	.91350	328	306	284	262	240	218	196	174	152
59	.91130	108	086	064	041	019	*997	*975	*952	*930
60	.90908	886	863	841	818	796	773	751	728	706
61	.90683	661	638	615	593	570	547	524	502	479
62	.90456	433	410	387	364	341	318	295	272	249
63	.90226	203	180	157	133	110	087	063	040	016
64	.89993	970	946	923	900	876	853	829	806	782
65	.89759	736	712	688	665	641	618	594	570	547
66	.89523	499	475	452	428	404	380	356	332	308
67	.89284	260	236	212	187	163	139	114	090	065
68	.89041	017	*992	*968	*943	*918	*894	*869	*844	*820
69	.88795	770	746	721	696	672	647	622	598	573
70	.88548	523	498	474	449	424	399	374	349	324
71	.88299	274	249	224	199	174	149	124	098	073
72	.88048	023	*997	*972	*947	*921	*896	*870	*845	*819
73	.87793	768	742	716	691	665	640	614	588	563
74	.87537	511	485	459	434	408	382	355	329	303
75	.87277	251	225	199	172	146	120	093	067	040
76	.87014	*988	*961	*935	*908	*881	*854	*828	*801	*774
77	.86747	720	693	666	639	612	585	558	531	504
78	.86477	450	423	395	368	341	313	286	258	231
79	.86203	176	148	120	093	065	038	010	*982	*955
80	.85927	899	871	843	816	788	760	731	703	675
81	.85647	619	591	562	534	506	478	449	421	392
82	.85364	336	307	278	250	221	192	164	135	106
83	.85077	048	019	*990	*961	*932	*903	*874	*845	*815
84	.84786	757	727	697	668	638	608	579	549	519
85	.84489	459	429	399	369	339	309	279	249	218
86	.84188	158	127	097	066	036	005	*974	*944	*913
87	.83882	851	820	789	758	727	695	664	632	601
88	.83569	537	506	474	442	410	378	346	314	281
89	.83249	217	184	152	119	087	054	021	*988	*955
90	.82922	889	856	823	789	756	722	689	655	622
91	.82588	554	520	486	452	417	383	348	314	279
92	.82244	209	174	139	104	068	033	*977	*962	*926
93	.81890	854	818	782	745	709	672	635	598	561
94	.81524	487	449	411	373	335	297	259	220	181
95	.81142	103	064	024	*985	*945	*905	*865	*825	*785
96	.80744	703	663	622	580	539	497	455	413	371
97	.80328	285	242	199	155	112	069	024	*979	*935
98	.79890	845	800	754	708	662	616	569	522	475
99	.79427	379	331	282	234	184	135	085	035	*984
100	.78933									

Density of Mixtures of Ethyl Alcohol and Water At Different Temperatures.

Per cent Alcohol by Weight	10°/4° C.	15°/4° C.	20°/4° C.	25°/4° C.	30°/4° C.	15.56°/4° C.
0	0.99973	0.99913	0.99824	0.99708	0.99568	0.99904
1	.99788	.99726	.99636	.99519	.99377	.99717
2	.99610	.99545	.99453	.99335	.99192	.99536
3	.99438	.99370	.99276	.99156	.99012	.99361
4	.99271	.99200	.99105	.98983	.98837	.99191
5	.99110	.99035	.98938	.98814	.98667	.99025
6	.98955	.98877	.98777	.98652	.98502	.98867
7	.98807	.98725	.98621	.98493	.98341	.98715
8	.98666	.98580	.98471	.98338	.98183	.98569
9	.98532	.98441	.98327	.98190	.98030	.98430
10	.98406	.98308	.98187	.98044	.97879	.98296
11	.98285	.98179	.98050	.97900	.97728	.98166
12	.98166	.98052	.97915	.97757	.97577	.98038
13	.98050	.97927	.97781	.97615	.97427	.97912
14	.97936	.97804	.97649	.97474	.97277	.97788
15	.97823	.97681	.97517	.97333	.97128	.97664
16	.97710	.97559	.97386	.97194	.96981	.97541
17	.97598	.97438	.97257	.97056	.96835	.97419
18	.97486	.97317	.97127	.96918	.96690	.97297
19	.97373	.97195	.96997	.96780	.96544	.97174
20	.97260	.97073	.96866	.96641	.96397	.97051
21	.97145	.96949	.96734	.96500	.96247	.96926
22	.97028	.96823	.96599	.96356	.96093	.96799
23	.96909	.96694	.96460	.96208	.95936	.96669
24	.96788	.96563	.96319	.96057	.95776	.96537
25	.96664	.96429	.96175	.95903	.95613	.96402
26	.96539	.96292	.96027	.95745	.95445	.96264
27	.96409	.96152	.95876	.95583	.95273	.96124
28	.96274	.96006	.95720	.95417	.95097	.95975
29	.96133	.95855	.95558	.95246	.94918	.95823
30	.95987	.95698	.95392	.95071	.94735	.95665
31	.95835	.95537	.95223	.94894	.94551	.95503
32	.95676	.95369	.95049	.94714	.94365	.95334
33	.95512	.95198	.94871	.94531	.94178	.95162
34	.95342	.95022	.94690	.94344	.93988	.94986
35	.95167	.94841	.94504	.94154	.93795	.94804
36	.94989	.94656	.94314	.93961	.93598	.94619
37	.94809	.94469	.94121	.93763	.93396	.94431
38	.94626	.94279	.93924	.93562	.93191	.94240
39	.94440	.94086	.93725	.93358	.92983	.94046
40	.94251	.93890	.93523	.93151	.92772	.93850
41	.94058	.93692	.93320	.92943	.92560	.93651
42	.93861	.93491	.93115	.92732	.92346	.93449
43	.93660	.93286	.92906	.92519	.92130	.93244
44	.93456	.93078	.92694	.92303	.91912	.93036
45	.93247	.92867	.92481	.92088	.91692	.92824
46	.93037	.92654	.92266	.91872	.91472	.92611
47	.92825	.92439	.92049	.91653	.91252	.92396
48	.92611	.92223	.91830	.91432	.91030	.92180
49	.92395	.92005	.91610	.91210	.90806	.91961
50	.92177	.91785	.91388	.90986	.90580	.91741
51	.91957	.91564	.91165	.90762	.90354	.91522
52	.91736	.91341	.90941	.90537	.90127	.91297
53	.91514	.91118	.90716	.90310	.89899	.91074
54	.91292	.90894	.90490	.90082	.89669	.90850
55	.91069	.90669	.90263	.89853	.89439	.90624

* The figures of this and the following table do not coincide throughout with those deduced from Table I of the Bureau of Standards.

Density of Mixtures of Ethyl Alcohol and Water At Different Temperatures.

Per cent Alcohol by Weight	10°/4° C.	15°/4° C.	20°/4° C.	25°/4° C.	30°/4° C.	15.56°/4° C.
56	0.90845	0.90443	0.90035	0.89624	0.89210	0.90398
57	.90620	.90216	.89807	.89395	.88980	.90171
58	.90393	.89987	.89577	.89164	.88748	.89942
59	.90166	.89758	.89347	.88934	.88517	.89713
60	.89938	.89528	.89116	.88702	.88284	.89482
61	.89709	.89298	.88885	.88469	.88050	.89252
62	.89479	.89067	.88653	.88236	.87816	.89021
63	.89248	.88835	.88420	.88001	.87580	.88789
64	.89017	.88602	.88185	.87766	.87344	.88556
65	.88784	.88368	.87950	.87530	.87107	.88322
66	.88550	.88134	.87715	.87293	.86868	.88088
67	.88315	.87899	.87479	.87056	.86629	.87853
68	.88080	.87663	.87242	.86818	.86389	.87616
69	.87844	.87427	.87006	.86580	.86148	.87380
70	.87607	.87190	.86768	.86340	.85907	.87143
71	.87370	.86953	.86531	.86102	.85666	.86906
72	.87133	.86715	.86292	.85862	.85425	.86668
73	.86896	.86476	.86052	.85622	.85184	.86429
74	.86659	.86237	.85812	.85381	.84943	.86190
75	.86421	.85997	.85572	.85140	.84701	.85951
76	.86181	.85756	.85330	.84898	.84457	.85710
77	.85940	.85515	.85087	.84653	.84212	.85468
78	.85698	.85272	.84844	.84407	.83965	.85225
79	.85454	.85028	.84599	.84161	.83717	.84981
80	.85209	.84783	.84352	.83914	.83468	.84735
81	.84962	.84536	.84104	.83665	.83218	.84488
82	.84714	.84288	.83856	.83417	.82968	.84240
83	.84465	.84038	.83606	.83166	.82718	.83990
84	.84214	.83787	.83355	.82915	.82466	.83739
85	.83961	.83534	.83102	.82662	.82212	.83486
86	.83707	.83280	.82847	.82407	.81960	.83232
87	.83450	.83023	.82590	.82150	.81704	.82975
88	.83191	.82763	.82330	.81890	.81444	.82715
89	.82929	.82501	.82067	.81627	.81181	.82453
90	.82664	.82236	.81802	.81362	.80915	.82188
91	.82395	.81967	.81533	.81092	.80646	.81919
92	.82122	.81695	.81261	.80819	.80373	.81647
93	.81846	.81419	.80985	.80543	.80097	.81371
94	.81567	.81140	.80706	.80265	.79818	.81092
95	.81285	.80858	.80424	.79983	.79536	.80810
96	.80996	.80568	.80135	.79696	.79251	.80520
97	.80700	.80272	.79841	.79405	.78964	.80224
98	.80399	.79972	.79542	.79109	.78672	.79924
99	.80093	.79667	.79239	.78810	.78377	.79620
100	.79782	.79358	.78933	.78507	.78079	.79311

Density of Mixtures of Ethyl Alcohol and Water At Different Temperatures.

Per cent Alcohol Volume	10°/4° C.	15°/4° C.	20°/4° C.	25°/4° C.	30°/4° C.	15.6°/4° C.
0	0.99973	0.99913	0.99824	0.99708	0.99568	0.99905
1	.99825	.99763	.99674	.99557	.99415	.99755
2	.99683	.99619	.99528	.99410	.99268	.99610
3	.99543	.99477	.99384	.99265	.99122	.99468
4	.99405	.99336	.99242	.99121	.98977	.99327
5	.99271	.99200	.99105	.98983	.98837	.99191
6	.99142	.99068	.98971	.98848	.98701	.99058
7	.99015	.98939	.98839	.98715	.98566	.98929
8	.98893	.98813	.98711	.98585	.98434	.98803
9	.98775	.98692	.98587	.98457	.98305	.98682
10	.98659	.98573	.98464	.98331	.98175	.98562
11	.98551	.98460	.98347	.98211	.98051	.98449
12	.98446	.98351	.98232	.98091	.97927	.98339
13	.98346	.98244	.98119	.97972	.97804	.98230
14	.98247	.98138	.98007	.97854	.97680	.98125
15	.98150	.98035	.97896	.97737	.97556	.98021
16	.98055	.97932	.97786	.97621	.97433	.97917
17	.97961	.97831	.97678	.97505	.97310	.97815
18	.97867	.97729	.97568	.97388	.97186	.97712
19	.97773	.97627	.97459	.97272	.97063	.97610
20	.97680	.97526	.97351	.97157	.96942	.97507
21	.97587	.97426	.97244	.97042	.96821	.97407
22	.97494	.97325	.97136	.96928	.96700	.97306
23	.97400	.97224	.97028	.96813	.96579	.97204
24	.97305	.97122	.96918	.96697	.96456	.97100
25	.97209	.97018	.96808	.96579	.96331	.96996
26	.97112	.96914	.96697	.96461	.96204	.96990
27	.97014	.96808	.96582	.96339	.96074	.96783
28	.96913	.96698	.96464	.96213	.95941	.96673
29	.96810	.96587	.96344	.96084	.95805	.96561
30	.96705	.96473	.96223	.95954	.95667	.96447
31	.96599	.96358	.96098	.95821	.95526	.96330
32	.96490	.96239	.95970	.95683	.95380	.96211
33	.96377	.96117	.95839	.95543	.95231	.96088
34	.96260	.95991	.95704	.95400	.95079	.95960
35	.96137	.95860	.95563	.95251	.94923	.95828
36	.96010	.95723	.95419	.95099	.94764	.95690
37	.95878	.95582	.95270	.94944	.94603	.95548
38	.95741	.95438	.95120	.94788	.94441	.95403
39	.95597	.95287	.94964	.94626	.94275	.95251
40	.95450	.95135	.94806	.94464	.94110	.95099
41	.95296	.94977	.94643	.94297	.93940	.94941
42	.95140	.94813	.94475	.94125	.93766	.94776
43	.94982	.94649	.94306	.93953	.93590	.94611
44	.94818	.94478	.94131	.93773	.93406	.94440
45	.94652	.94306	.93954	.93590	.93220	.94267
46	.94481	.94129	.93769	.93403	.93029	.94089
47	.94310	.93951	.93586	.93215	.92837	.93911
48	.94131	.93767	.93397	.93022	.92641	.93727
49	.93952	.93583	.93209	.92829	.92444	.93542
50	.93765	.93393	.93014	.92629	.92242	.93351
51	.93574	.93199	.92816	.92428	.92038	.93157
52	.93379	.93000	.92615	.92223	.91831	.92958
53	.93180	.92799	.92412	.92019	.91622	.92756
54	.92980	.92596	.92207	.91813	.91413	.92553
55	.92774	.92387	.91996	.91600	.91199	.92344

Density of Mixtures of Ethyl Alcohol and Water At Different Temperatures.

Per cent Alcohol Volume	10°/4° C.	15°/4° C.	20°/4° C.	25°/4° C.	30°/4° C.	15.6°/4° C.
56	0.92568	0.92179	0.91786	0.91388	0.90985	0.92136
57	.92356	.91965	.91570	.91170	.90766	.91921
58	.92142	.91750	.91352	.90950	.90544	.91706
59	.91924	.91531	.91131	.90728	.90320	.91487
60	.91704	.91310	.90910	.90505	.90095	.91266
61	.91483	.91087	.90684	.90278	.89867	.91043
62	.91261	.90863	.90458	.90050	.89637	.90818
63	.91033	.90633	.90227	.89816	.89402	.90588
64	.90805	.90402	.89994	.89583	.89169	.90357
65	.90575	.90170	.89761	.89349	.88934	.90124
66	.90341	.89934	.89524	.89111	.88695	.89889
67	.90104	.89696	.89285	.88871	.88454	.89651
68	.89865	.89454	.89042	.88627	.88209	.89408
69	.89622	.89210	.88797	.88381	.87961	.89164
70	.89377	.88965	.88550	.88133	.87712	.88919
71	.89130	.88716	.88300	.87881	.87460	.88670
72	.88882	.88466	.88049	.87630	.87207	.88420
73	.88627	.88211	.87792	.87371	.86947	.88165
74	.88371	.87955	.87536	.87113	.86686	.87909
75	.88113	.87696	.87275	.86851	.86423	.87649
76	.87849	.87431	.87010	.86585	.86152	.87384
77	.87583	.87166	.86744	.86317	.85883	.87119
78	.87315	.86898	.86476	.86047	.85610	.86851
79	.87045	.86627	.86203	.85773	.85336	.86580
80	.86773	.86352	.85927	.85497	.85059	.86305
81	.86497	.86075	.85649	.85217	.84778	.86028
82	.86217	.85793	.85366	.84934	.84494	.85746
83	.85933	.85508	.85080	.84646	.84205	.85461
84	.85644	.85218	.84790	.84353	.83910	.85171
85	.85349	.84923	.84493	.84055	.83610	.84875
86	.85048	.84622	.84191	.83752	.83306	.84574
87	.84744	.84318	.83886	.83447	.82998	.84270
88	.84432	.84005	.83573	.83133	.82685	.83957
89	.84113	.83686	.83254	.82814	.82365	.83538
90	.83788	.83361	.82929	.82489	.82041	.83313
91	.83455	.83028	.82595	.82155	.81709	.82980
92	.83113	.82681	.82252	.81812	.81366	.82837
93	.82761	.82333	.81899	.81459	.81013	.82285
94	.82392	.81964	.81530	.81089	.80643	.81916
95	.82009	.81582	.81148	.80706	.80260	.81534
96	.81612	.81185	.80751	.80310	.79863	.81137
97	.81195	.80768	.80334	.79894	.79448	.80720
98	.80753	.80325	.79894	.79457	.79015	.80277
99	.80283	.79856	.79427	.78995	.78560	.79808
100	.79782	.79358	.78933	.78507	.78079	.79311

Density of Mixtures of Ethyl Alcohol and Water (in Vacuo).

Per cent Alcohol by Volume*	Density 15°/4° C	Density 20°/4° C	Density 25°/4° C	Per cent Alcohol by Volume*	Density 15°/4°C	Density 20°/4° C	Density 25°/4° C
0.....	0.99913	0.99824	0.99708	50.....	0.93393	0.93013	0.92630
1.....	.99763	.99674	.99558	51.....	.93199	.92815	.92429
2.....	.99617	.99527	.99413	52.....	.93001	.92614	.92225
3.....	.99474	.99383	.99268	53.....	.92800	.92411	.92018
4.....	.99332	.99241	.99124	54.....	.92596	.92205	.91809
5.....	.99197	.99102	.98984	55.....	.92389	.91995	.91597
6.....	.99066	.98968	.98848	56.....	.92179	.91783	.91383
7.....	.98938	.98838	.98715	57.....	.91967	.91568	.91167
8.....	.98814	.98710	.98584	58.....	.91752	.91350	.90947
9.....	.98693	.98585	.98455	59.....	.91533	.91130	.90725
10.....	.98574	.98463	.98329	60.....	.91313	.90908	.90501
11.....	.98460	.98345	.98206	61.....	.91089	.90683	.90275
12.....	.98349	.98230	.98085	62.....	.90863	.90456	.90046
13.....	.98241	.98116	.97965	63.....	.90634	.90226	.89814
14.....	.98135	.98004	.97848	64.....	.90402	.89993	.89581
15.....	.98032	.97895	.97732	65.....	.90169	.89759	.89346
16.....	.97930	.97787	.97618	66.....	.89934	.89526	.89109
17.....	.97830	.97680	.97504	67.....	.89696	.89284	.88869
18.....	.97730	.97572	.97390	68.....	.89454	.89041	.88625
19.....	.97630	.97465	.97276	69.....	.89209	.88795	.88379
20.....	.97531	.97358	.97162	70.....	.88964	.88548	.88131
21.....	.97432	.97251	.97047	71.....	.88716	.88299	.87881
22.....	.97332	.97143	.96932	72.....	.88466	.88048	.87629
23.....	.97232	.97034	.96816	73.....	.88212	.87793	.87373
24.....	.97129	.96923	.96697	74.....	.87955	.87537	.87115
25.....	.97025	.96811	.96577	75.....	.87696	.87277	.86854
26.....	.96920	.96698	.96456	76.....	.87433	.87014	.86588
27.....	.96813	.96582	.96333	77.....	.87168	.86747	.86320
28.....	.96703	.96463	.96207	78.....	.86899	.86477	.86050
28.....	.96590	.96342	.96079	79.....	.86628	.86203	.85775
30.....	.96475	.96219	.95948	80.....	.86352	.85927	.85496
31.....	.96357	.96093	.95814	81.....	.86074	.85647	.85215
32.....	.96234	.95963	.95677	82.....	.85791	.85364	.84930
33.....	.96110	.95830	.95537	83.....	.85506	.85077	.84641
34.....	.95982	.95695	.95395	84.....	.85216	.84786	.84348
35.....	.95850	.95555	.95249	85.....	.84921	.84489	.84050
36.....	.95713	.95411	.95099	86.....	.84621	.84188	.83748
37.....	.95571	.95263	.94944	87.....	.84316	.83882	.83440
38.....	.95427	.95112	.94786	88.....	.84004	.83569	.83126
39.....	.95279	.94957	.94625	89.....	.83685	.83249	.82805
40.....	.95128	.94799	.94462	90.....	.83361	.82922	.82478
41.....	.94973	.94637	.94295	81.....	.83027	.82588	.82142
42.....	.94812	.94471	.94124	92.....	.82683	.82244	.81797
43.....	.94649	.94302	.93949	93.....	.82330	.81890	.81443
44.....	.94480	.94129	.93770	94.....	.81963	.81525	.81077
45.....	.94309	.93951	.93588	95.....	.81581	.81142	.80695
46.....	.94131	.93769	.93401	96.....	.81183	.80744	.80301
47.....	.93952	.93585	.93213	97.....	.80764	.80328	.79886
48.....	.93770	.93398	.93022	98.....	.80324	.79890	.79452
49.....	.93584	.93208	.92828	99.....	.79856	.79427	.78993
				100.....	.79588	.78933	.78507

* *i. e.* Volume percent when reduced to standard temperature, 60° F.

N. B.—The figures of this table are deduced from those of Table 1 of the Bureau of Standards.

A PRACTICAL CLASSIFICATION OF THE QUANTITATIVE TESTS OF THE U. S. P. (8TH REVISION).

BY FRANK X. MOERK.

In a paper presented to the Association last year, attention was called to the multiplicity of directions for official assay processes and to the varied methods of expressing the results.

In the paper now submitted all of the quantitative determinations based upon similar methods are grouped together, so that it will not be a very difficult matter to formulate methods applicable to entire groups. In framing these methods it may be advisable to paragraph the directions so that after any necessary changes in the earlier part of the process, the directions can be continued according to a specified paragraph, thus saving unnecessary repetitions.

All results of quantitative determinations should as far as possible be expressed in percentage statements: a few exceptions to this are to be noted: (1) The acid and saponification figures of oils, fats, waxes, resins, etc.; (2) Liquid preparations containing alkaloids (grams per 100 Cc.), this method also is frequently used in wines and liquors; and (3) Maximum and minimum determinations of impurities which are of indefinite composition, as the acidity of calcium hypophosphite, amyl nitrite, etc., and the oxidizable matter by potassium permanganate in acetic acid, water, etc., etc.

Chemicals should be examined as found and not after subjecting them to some treatment which they will not receive before selling or using. In so many cases the U. S. P. directs before testing they should be dried, well-dried or anhydrous without giving the necessary temperature for affecting this. There are just as good reasons for incorporating directions for the regeneration of efflorescent products as there are for those which are deliquescent.

The processes of the Pharmacopœia should be of such character and simplicity that they can be used by pharmacists of average ability, and to encourage these it might be well to compile a list of apparatus used in these processes. The time may not be so distant when State Boards will require of candidates for registration evidence that the latter are capable of examining drugs for their purity and strength.

The legal status of the U. S. P. warrants the introduction of official methods for determining.

(1) Specific Gravities; (2) Melting Points; (3) Congealing Points; (4) Boiling Points and (5) Solubilities.

GRAVIMETRIC DETERMINATIONS.

I. By Drying.

A. VOLATILE MATTER DETERMINED.

(1) *In Solids.*

Substance.	Quantity Taken.	Temperature ° C.	Loss.	
			Per Cent.	Due to
Cinchonine sulphate	1 Gm.	100°	5 p. c.	2 Mols. H_2O (all)
Soap	0.5 Gm., 1 Gm. sand, 10 Cc. alcohol.	110°	36 p. c.	Moisture.
Aloes	——	100°	10 p. c.	Moisture.
Aloin	——	100°	——	1 Mol. H_2O (?)
Alum	——	200°	45.55 p. c.	12 " " " (all)
Aluminum sulphate	——	200°	45.7 p. c.	16 " " "
Antimony potass. tartrate	——	110°	2.71 p. c.	1 " " "
Cinchonidine sulphate	——	100°	(7.3 p. c.)	3 " " "
Codeine	——	100°	(5.68 p. c.)	1 " " "
Codeine phosphate	——	100°	(8.32 p. c.)	2 " " "
Codeine sulphate	——	100°	(11.45 p. c.)	5 " " "
Copper sulphate	——	30°	14.43 p. c.	2 " "
	——	100°	(28.86 p. c.)	4 " "
	——	200°	36.10 p. c.	5 " " "
Magnesium sulphate	——	52°	(7.31 p. c.)	1 " "
	——	130°	(43.84 p. c.)	6 " "
	——	200–238°	(51.15 p. c.)	7 " " "
Morphine	——	100°	(5.94 p. c.)	1 " " "
Morphine hydrochloride	——	100°	(14.39 p. c.)	3 " " "
Morphine sulphate	——	160°	(11.87 p. c.)	5 " " "
Musk	——	——	(15 p. c.)	——
Lead acetate	——	40°	14.26 p. c.	3 " " "
Potassium citrate	——	100°	?	?
	——	200°	5.55 p. c.	1 " " "
Quinine	——	100°	(9.52 p. c.)	2 " "
	——	125°	14.3 p. c.	3 " " "
Quinine bisulphate	——	100°	23 p. c.	7 " " "
Quinine hydrobromide	——	100°	4.25 p. c.	1 " " "
Quinine hydrochloride	——	100°	9.10 p. c.	2 " " "
Quinine salicylate	——	100°	(1.91)–2 p. c.	1 " " "
Quinine sulphate	——	60°	(10.32 p. c.)	5 " "
		115°	(14.45 p. c.)	7 " " "
		115°	16.18 p. c.	8 " "
Sodium acetate	——	123°	(39.70 p. c.)	3 " " "
Sodium arsenate	——	gentle heat	28.85 p. c.	5 " "
		148°	(40.39 p. c.)	7 " " "
Sodium bicarbonate	——	100°	36.5 p. c.	$H_2O + CO_2$
Sodium carbonate monohyd.	——	50°	?	?
		100°	14.52 p. c.	1 Mol. H_2O (all)
Sodium citrate	——	150°	(27.73 p. c.)	11 " " "
Sodium phenolsulphonate	——	little over 100°	15.5 p. c.	2 " " "
Sodium phosphate	——	effloresces ?	25.1 p. c.	5 " "
		100°	60.3 p. c.	12 " " "
Sodium pyrophosphate	——	100°	40.35 p. c.	10 " " "
Sodium sulphate	——	effloresces ?	55.9 p. c.	10 " " "
		100°	55.9 p. c.	10 " " "
Sodium sulphite	——	above 100°	50 p. c.	7 " " "
Sodium thiosulphate	——	33°	?	?
		100°	36.3 p. c.	5 " " "
Sparteine sulphate	——	110°	21.3 p. c.	5 " " "
Strychnine sulphate	——	100°	10.59 p. c.	5 " " "
Zinc phenolsulphonate	——	100°	(19.45 p. c.)	6 " "
	——	125°	(25.93 p. c.)	8 " " "
Zinc sulphate	——	50°	31.32 p. c.	5 " "
		100°	(37.59 p. c.)	6 " "
		240°	?	7 " " (+So_3)

I. A. 2. In Liquids. Alcohol Determinations.

Wine, red } 7–12 per cent. by weight of absolute alcohol.
Wine, white } 8.5–15 per cent. by volume of absolute alcohol.

I. B. Residual Matter Determined.

Substance.	Quantity Taken.	Temperature ° C.	Residue.	
			Per cent. or Weight.	Due to
Acid hydriodic dil.	——	115°	8.3 p. c.	Fixed salts.
Hydrogen dioxide sol.	20 Cc.	120°	0 03 Gm.	"
Water	1000 Cc.	100°	0.5 "	"
Water, distilled	1000 Cc.	100°	0.05 "	"
Whisky	100 Cc.	100°	0.5 "	Extractive.
Brandy	100 Cc.	100°	0.5 "	"
Wine, red	——	12 hrs. water bath.	1.6–3.5 p. c.	"
Wine, white	——	12 hrs. water bath.	1.5–3 p. c.	"

II. By Ignition (Low-Red Heat).

A. VOLATILE MATTER DETERMINED.

Substance.	Quantity Taken.	Loss.	
		Per cent. or Weight.	Due to
Manganese sulphate	1 Gm.	0.323 Gm.	4 Mols. H_2O (all)
Kaolin	——	15 per cent.	H_2O
Lead oxide	——	4 per cent.	$H_2O + CO_2$
Magnesium oxide	——	15 per cent.	H_2O
Sodium borate	——	47 per cent.	10 Mol. H_2O (all)
Talc, purified	——	15 per cent.	H_2O

B. RESIDUAL MATTER DETERMINED.

1. *Definite Composition of Residue.*

a. Without Further Treatment.

Substance (Per cent. Purity).	Quantity Taken.	Residue.	
		Per cent. or Weight.	Due to
Bismuth subcarbonate	1 Gm.	0.9 Gm.	Bi_2O_3
Bismuth subnitrate	2 Gm.	1.6 Gm.	"
Silver oxide (99.8 p. c.)	0.5 Gm.	0.464 Gm.	Ag (metal)
Silver cyanide (99.9 p. c.)	——	80.48 per cent.	"
Magnesium carbonate	——	40 "	MgO
Potassium chlorate	——	60.8 "	KCl
Sodium chlorate	——	55 "	NaCl
Sodium phenolsulphonate	——	30.6 "	Na_2SO_4
Zinc phenolsulphonate	——	14.6 "	ZnO
Zinc carbonate	——	72 "	ZnO

II. B. 1. b. After Some Treatment.

Substance (p. c. Purity).	Quantity Taken and Treatment.	Residue.	
		Weight.	Calc. to p. c. Purity.
Bismuth citrate	Ignite 1 Gm., dissolve in HNO_3, evaporate and ignite	0.56 –0.58 Gm. Bi_2O_3	
Bismuth am. citrate.		0.46 –0.50 Gm. Bi_2O_3	
Bismuth subgallate		0.52 –0.57 Gm. Bi_2O_3	
Bismuth subsalicylate		0.62 –0.66 Gm. Bi_2O_3	
Lithium citrate (98.5 p. c.)	Ignite 0.5 Gm., add HNO_3 + H_2SO_4, re-ignite	0.387–0.394 Gm. Li_2SO_4	98.45–100.23
Strontium salicylate (98.5 p. c.)	Ignite 0.5 Gm., + 1 Cc. H_2SO_4, add H_2SO_4, re-ignite	0.227 Gm. $SrSO_4$	98.31
Lithium benzoate (98.5 p. c.)	Ignite 0.5 Gm., + 1 Gm. $(NH_4)_2SO_4$	0.210–0.216 Gm. Li_2SO_4	97.7 –100.47
Lithium salicylate (98.5 p. c.)	Ignite 0.5 Gm., + 1 Gm. $(NH_4)_2SO_4$	0.188–0.192 Gm. Li_2SO_4	98.37–100.46

II. B. 2. Indefinite Products.

A. Fixed Mineral Matter in Volatile or Combustible Substances.

Substance.	Quantity Taken.	Per Cent. or Weight of Residue.
Acid, Lactic	5 Gm.	0.05 Gm. (1 per cent.)
Formaldehyde solution	20 Cc.	0.05 per cent.
Methylene blue	2 Gm.	0.008 Gm. (0.4 per cent.)
Thymol iodide	0.1 Gm.	0.003 Gm. (3 per cent.)
Ammonium Chloride	1 Gm. + HNO_3	0.005 Gm. (0.5 per cent.)

In the following only the per cent. of residue is given:

Acid, citric	0.05 per cent.	Mercuric oxide, yellow	0.1 per cent.
Acid, salicylic	0.6 per cent.	Mercuric iodide, red	0.05 per cent.
Acid, tannic	0.6 per cent.	Mercurous iodide, yellow	0.05 per cent.
Acid, tartaric	0.05 per cent.	Resin, podophyllum	1 per cent.
Charcoal, animal	85 per cent.	Resin, scammony	1 per cent.
Charcoal, animal, pfd	4 per cent.	Starch	1 per cent.
Cotton, pfd	0.3 per cent.	Sugar, milk	0.25 per cent.
Gelatin	2 per cent.	Sulphur, sublimed	0.5 per cent.
Iodoform	0.2 per cent.	Sulphur, washed	0.2 per cent.
Iodol	0.1 per cent.		

II. B. 2. b. Fixed Mineral Matter in Drugs—Ash Determinations.

In the following only the per cent. of ash is given:

Acacia	4 per cent.	Gamboge	3 per cent.
Asafetida	15 per cent.	Glands, supraren., des.	7 per cent.
Benzoin	2 per cent.	Glands, thyroid, des	6 per cent.
Cantharides	8 per cent.	Guaiac	4 per cent.
Caraway	8 per cent.	Honey	0.3 per cent.
Cardamom	8 per cent.	Lupulin	10 per cent.
Ceylon cinnamon	4 per cent.	Lycopodium	5 per cent.
Cloves	8 per cent.	Musk	8 per cent.
Cochineal	6 per cent.	Pepper	7 per cent.
Gambir	5 per cent.	Scammony	3 per cent.

Wine, red } 100 Cc. evaporated, ignited, moistened { 0.22–0.34 Gm. residue.
Wine, white } with $(NH_4)_2CO_3$ and re-ignited. { 0.14–0.26 Gm. residue.

III. Special Methods.

Gold and sodium chloride: 0.5 Gm. should yield 0.15 Gm. Au = 30 per cent. Au.

Mercurial ointment: 10 Gm. should yield 4.9 Gm. Hg = 49 per cent. Hg.

Zinc chloride: 0.5 Gm. should yield 0.297 Gm. ZnO = 99.5 per cent. $ZnCl_2$.

Zinc stearate: 1 Gm. should yield 0.14–0.16 Gm. ZnO.

Calcium sulphide; 1 Gm. should completely precipitate 1.9 Gm. $CuSO_45H_2O$ = 55 per cent. CaS.

Zinc iodide: 1 Gm. + 1.5 Gm. $AgNO_3$ + NH_3; filtrate + HNO_3 only slightly turbid: limit of chloride. The $AgNO_3$ will precipitate 1.4 Gm. ZnI_2.

Lithium benzoate: 0.6 Gm. with HCl and amyl alcohol yield not more than 0.004 Gm. insoluble.

Lithium bromide: 0.4 Gm. with HCl and amyl alcohol yield not more than 0.007 Gm. insoluble.

Lithium carbonate: 0.2 Gm. with HCl and amyl alcohol yield not more than 0.003 Gm. insoluble.

Lithium citrate: 0.2 Gm. with HCl and amyl alcohol yield not more than 0.002 Gm. insoluble.

Lithium salicylate: 0.7 Gm. with HCl and amyl alcohol yield not more than 0.005 Gm. insoluble.

Balsam Peru: 2.5 Gm. should yield 1.4 Gm. or 56 per cent. cinnamein.

Jalap: 10 Gm. should yield 1.05 per cent. resin to ether; then residual drug should yield 5.95 per cent. resin soluble in alcohol and chloroform.

IV. Alkaloidal Assay Processes.

Drug or Preparation.	Quantity Taken. Start.	Finish.	Alkaloid Obtained.	Dried at	U. S. P. Requirement.
Opium	10 Gm.	10 Gm.	By precipitation.	60° C.	9 p. c. morphine.
Opium, powdered	10 "	10 "	" "	"	12–12.5 p. c. morphine.
Opium extract	6 "	6 "	" "	"	20 p. c. morphine.
Opium extract before completion	20 "	20 "	" "	"	(?)
Opium, deodorized	10 "	10 "	" "	"	12–12.5 p. c. morphine.
Opium, granulated	10 "	10 "	" "	"	12–12.5 p. c. morphine.
Opium tincture	100 Cc.	100 Cc.	" "	"	1.2–1.25 Gm. morphine.
Opium tincture, deodorized	100 "	100 "	" "	"	1.2–1.25 Gm. morphine.
Cinchona: Total alkaloids	15 Gm.	5 Gm.	By $CHCl_3$ extraction.	110° C.	5 p. c. total alkaloid.
Iron quinine citrate	2 "	2 "	" "	100° C.	11.5 p. c. dried quinine.
Iron quinine citrate, soluble	2 "	2 "	" "	"	11.5 p. c. dried quinine.
Iron strychnine citrate	5 "	5 "	" "	"	0.9–1 p. c. strychnine.
Codeine phosphate	0.2 "	0.2 "	" "	(?)	0.13 Gm. codeine.
Colchicum corm	10 "	5 "	" "	100° C.	0.35 p. c. alkaloids.
Colchicum extract	4 "	2 "	" "	"	1.4 p. c. alkaloids.
Colchicum seed	10 "	5 "	" "	"	0.45 p. c. alkaloids.
Colchicum fluidextract	10 Cc.	10 Cc.	" "	"	0.4 Gm. in 100 Cc.
Colchicum tincture	100 "	100 "	" "	"	0.04 Gm. in 100 Cc.
Guarana	6 Gm.	5 Gm.	" "	Water bath.	3.5 p. c. alkaloids.
Guarana fluidextract	5 Cc.	5 Cc.	" "	"	3.5 Gm. in 100 Cc.
Cinchona: ether-soluble	15 Gm.	5 Gm.	By ether extraction.	110° C.	4 p. c. ether-soluble alkaloid.
Cinchona fluidextract	10 Cc.	5 Cc.	" "	"	4 Gm. in 100 Cc.
Cinchona tincture	50 "	25 "	" "	"	0.75 Gm. in 100 Cc.
Hydrastis	15 Gm.	10 Gm.	" "	100° C.	2.5 p. c. hydrastine.
Hydrastis fluidextract	10 Cc.	5 Cc.	" "	Water bath.	2 Gm. in 100 Cc.
Hydrastis tincture	100 "	50 "	" "	"	0.4 Gm. in 100 Cc.
Conium	10 Gm.	5 Gm.	As hydrochlorate.	60° C.	0.5 p. c. alkaloid.
Conium fluidextract	10 Cc.	5 Cc.	" "	"	0.45 Gm. in 100 Cc.

V. Assays of Digestive Ferments.

Pepsin digesting 3,000 times its weight of egg albumen.

Pancreatin converting 25 times its weight of starch.

COMMENTS ON THE GRAVIMETRIC DETERMINATIONS.

The figures given in parenthesis have been supplied by the writer; were these omitted, the varied method of expressing results would be very evident:

Weight taken: The scarcity of directions for this is a good indication that a method can be formulated which will have wide applicability. The weight taken should be dependent upon the final weight to be obtained so that this will not be too small to impair the accuracy, *i. e.*, under thymol iodide 0.1 Gm. is directed and the ash should not weigh more than 0.003 Gm.; when we consider the volatility of haloid salts this assay is carried out with too small a quantity.

Temperature. In sodium arsenate, sodium phenolsulphonate, etc.. etc., the temperature should be more definitely stated.

Ash Determinations. The nature of the crucible or dish and the method used should be stated; the latter may be

1. In absence of alkali and alkaline earths: Direct ignition.

2. In absence of alkali, but presence of alkaline earths: Ignition, followed by addition of $(NH_4)_2CO_3$.

3. In presence of alkali: Charring, extracting with H_2O, igniting insoluble matter, adding H_2O solution, evaporating and igniting.

Lithium Salts. The sulphate obtained in the process and calculated to original substance may give per cent. figures exceeding the U. S. P. requirement; this is due to the presence of other alkalies.

The HCl and amyl alcohol tests give no directions for washing and drying the insoluble foreign alkaline salts.

Alkaloidal Assays:

Opium. By changing the weight of the opium extract in course of preparation to 20 Gm. (from 12 Gm.), and of the opium extract to 6 Gm. (from 4 Gm,) a uniform method for all opium preparations will result.

Cinchona. Under quinine, 125° C. is required to render the alkaloid anhydrous; in the cinchona assays 110° C. is specified for the same object; while in the assays of iron-quinine citrate and its soluble variety 100° C. is specified.

Iron and Quinine Citrate and its *soluble form:* The weight directed is is increased to 2 Gm. so as to yield a weight of alkaloid approaching that obtained in the assay of the drug, also to correspond to a change suggested in the iron assay.

Conium. Under the drug alcohol, while under the fluidextract absolute alcohol is directed for the separation of the $(NH_4)_2SO_4$.

Iron and Strychnine Citrate. Weight taken increased to 5 Gm. to correspond to a change in the iron assay; as the weight of strychnine obtained, 0.045–0.05 Gm., is small, it might be well to determine it volumetrically, as it will be equivalent to 6.8–7.55 Cc. fiftieth normal KOH.VS.

Indefinite Statements:

Aloin at 100° C. loses one molecule H_2O; neither formula nor the equivalent per cent. of water is given.

Starch, 95 per cent. hydrolyzable carbohydrate.

VOLUMETRIC DETERMINATIONS.

Solids are carefully weighed; while of liquids measured (drops or cubic centimeters) quantities are carefully weighed.

Conforming to these statements are many official assays; in many others, however, specified weights running into mgms., are directed to be dissolved in water to make a definite volume of which an aliquot portion is taken (often to 0.01 Cc.) and the necessary quantity of VS. must be measured often 0.01 Cc. to realize the official requirement.

From a practical view there is no question as to the better method; as 0.05 Cc. V. S. in U. S. P. assays usually means a difference of 0.2–0.3 per cent. in the purity of the substance, some little allowance should be made, especially as there are requirements like 99.5 per cent., 99.8 per cent., and even 99.9 per cent.

A. Direct Titrations.

1. depending upon neutralization.

a. 1. With Aqueous Alkaline V. S. KOH V. S. (exceptions NaOH in H_3BO_3 and $HC_2Cl_3O_2$).

Substances.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories and Solvents, Official Proportion.	Indicator.	Cc. V. S. n = normal, tn = tenth-normal.	Ratio for Calc. 6 KOH or 6 NaOH =
Acid, boric	99.8 p. c.	.....	1.	50 Cc. each H_2O, glycer.	Ph.	16.2 n.	$6H_3BO_3$
" citric	99.5 "	.....	1.	25 Cc. H_2O	"	14.3 "	$2(H_3C_6H_5O_7H_2O)$
" tartaric	99.5 "	.....	1.	.....	"	13.35 "	$3H_2C_4H_4O_6$
" trichloracetic	98.9 "	.....	1.	50 Cc. H_2O	"	6.1 "	$6HC_2Cl_3O_2$
" acetic	36 "	3 Cc.	3.135	30 Cc. H_2O	"	18.95 "	$6HC_2H_3O_2$
" " glacial	99 "	3 "	3.147	50 Cc. H_2O	"	52.3 "	"
" hydrochloric	31.9 "	3 "	3.474	50 Cc. H_2O	M-O.	30.65 "	6HCl
" hypophosphorous	30 "	3 "	3.390	35 Cc. H_2O	"	15.5 "	$6H(H_2PO_2)$
" lactic	75 "	3 "	3.618	35 Cc. H_2O	Ph.	30.35 "	$6HC_3H_5O_3$
" nitric	68 "	3 "	4.209	50 Cc. H_2O	M-O.	45.75 "	$6HNO_3$
" phosphoric	85 "	3 "	5.121	50 Cc. each H_2O, sat. NaCl	Ph.	89.5 "	$3H_3PO_4$
" sulphuric	92.5 "	3 "	5.478	50 Cc. H_2O	M-O.	104.1 "	$3H_2SO_4$
" acetic, dil.	6 "	10 "	10.090	.....	Ph.	10.15 "	$6HC_2H_3O_2$
" hydrochloric, dil.	10 "	10 "	10.490	60 Cc. H_2O	M-O.	29 "	6HCl
" hypophosphorous, dil.	10 "	10 "	10.420	100 Cc. H_2O	"	15.9 "	$6H(H_2PO_2)$
" nitric, dil.	10 "	10 "	10.540	.....	"	16.85 "	$6HNO_3$
" phosphoric, dil.	10 "	10 "	10.570	10 sat. NaCl	Ph.	21.75 "	$3H_3PO_4$
" sulphuric, dil	10 "	10 "	10.670	.....	M-O.	21.9 "	$3H_2SO_4$
Lemon juice	7–9 "	10 "	10.350	.....	Ph.	10.4–13.4 "	$2(H_3C_6H_5O_7H_2O)$
Maximum Acidity Limit.							
Paraldehyde	0.38 p. c.	10 "	9.900	10 Cc. alcohol	Ph.	0.65 "	$6HC_2H_3O_2$
Formaldehyde, Sol.	0.21 "	20 "	21.520	.....	"	1 "	$6HCHO_2$
Wine, red	0.45–077 Gm. in 100 Cc.	50 "	.....	.....	Lit.	3–5.2 "	$3H_2C_4H_4O_6$
Wine, white		50 "	.....	.....	"	3–5.2 "	"
Brandy	0.059 Gm.	100 "	.....	.....	"	1 "	$6HC_2H_3O_2$
Whisky	0.071 Gm.	100 "	.....	.....	"	1.2 "	"
Malt	0.3 p. c.	.....	10 Gm.	(?)	Ph.	3.35 tn.	$6HC_3H_5O_3$
Calcium hypophosph	.....	.....	1 Gm.	20 Cc. H_2O	"	1 tn.	
Amyl nitrite	.....	5 Cc.	.....	10 Cc. H_2O	"	1 n.	

a. 2. With Alcoholic Alkaline V. S. Half-normal KOH.

Acid-figures Mgm. KOH to Neutralize 1 Gm. Fat, Wax, Resin, etc., etc.

Substance.	Requirement U. S. P.	Quantity.	Accessories and Solvents, Official Proportion.	Indicator.	Cc. h–n. Alc. KOH.
Balsam Peru	([?]–55.74)	1 Gm.	100 Cc. alcohol	Ph.	(?)–2
Balsam Tolu	(115.–167.2)	1 "	50 " "	"	4–6
Copaiba	(64.1–89.2)	1 "	50 " "	"	2.3–3.2
Guaiac	70–80	1 "	Alcohol	"	2.5–2.85
Mastic	65–(?)	1 "	"	"	2.3–(?)
Resin	150–(?)	1 "	"	"	5.35–(?)
Resin Jalap	([?]–13.9)	1 "	50 Cc. alcohol	"	(?)–0.5
Lard	([?]–1.1)	10 "	Dis. in $CHCl_3$ + 10 Cc. alcohol	"	(?)–1
Wool-fat	([?]–1.4)	2 "	10 Cc. ether	"	(?)–0.25

A. I. b. With Acid V. S.

Substance.	Requirement U. S. P.	Quantity		Accession and Solvents, Official Proportion.	Indicator.	Cc. Acid V. S. n = normal, hn = half-normal tn = tenth-normal	Ratio for Calcul., $3H_2SO_4$, $3H_2C_2O_4$ $2H_2O$ or 6 HCl =
		Cc.	Gm.				
Ammonia spirit	10 p. c.	3 Cc.	2.424	50 Cc. H_2O	L	14.3 n H_2SO_4	6 NH_3
Ammonia water	10 "	3 "	2.874	50 " "	L or M-O	17 " "	6 "
Ammonia water stronger	28 "	3 "	2.691	50 " "	L or M-O	44.5 " "	6 "
Potasium hydroxide	85 "	.....	1.	50 " "	M-O	15.25 " "	6 KOH
Sodium hydroxide	90 "	.....	1.	50 " "	"	22.65 " "	6 NaOH
Potassium carbonate	98 "	.....	1.	50 " "	"	14.3 " "	4 K_2CO_3
Sodium carbon. monoh	99.5 "	.....	1.	10 " "	"	16.15 " "	3 ($Na_2CO_3H_2O$)
Sodium carbon. anhyd	99.5 "	.....	1.	10 " "	"	18.9 " "	3 Na_2CO_3

A. I. b. WITH ACID V. S.—*Concluded.*

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories and Solvents, Official Proportion.	Indicator.	Cc. Acid V. S. n = normal. hn = half normal. tn = tenth normal.	Ratio for Calcul., $3H_2SO_4$, $3H_2C_2O_4$ $2H_2O$ or 6HCl =
Potassium hydroxide sol'n	5 p. c.	25 Cc.	26.15	.....	M.-O.	23.45 n. H_2SO_4	6KOH
Sodium hydroxide solution	5 "	25 Cc.	26.4	.....	"	33.2 " "	6NaOH
Sodium bicarbonate	99 "	.....	2.	.....	"	23.75 " "	$6NaHCO_3$
Potassium bicarbonate	99 "	.....	2.	.....	"	19.9 " "	$6KHCO_3$
Potassium acetate	98 "	.....	1.	Thoroughly clear, extract with H_2O and titrate; add successive washings to titrated solution until these no longer change the red color to yellow.	"	20.1 hn. "	$6KC_2H_3O_2$
Potassium bitartrate	99 "	.....	1.		"	10.6 " "	$6KHC_4H_4O_6$
Potassium citrate	99 "	.....	1.		"	18.45 " HCl	$2(K_3C_6H_5O_7H_2O)$
Potassium citrate solution	8.5 "	10 Cc.	10.59		"	16.75 " H_2SO_4	$2(K_3C_6H_5O_7H_2O)$
Potassium sodium tartrate	99 "	.....	1.		"	14.15 " HCl	$3(KNaC_4H_4O_64H_2O)$
Sodium acetate	99 "	.....	1.		"	14.75 " H_2SO_4	$6(NaC_2H_3O_23H_2O)$
Sodium benzoate	99 "	.....	1.		"	13.85 " HCl	$6NaC_7H_5O_2$
Sodium citrate	97 "	.....	1.		"	16.4 " H_2SO_4	$(Na_3C_6H_5O_7)_211H_2O$
Sodium salicylate	99.5 "	.....	1.		"	12.5 " "	$6NaC_7H_5O_3$
Lime water	0.14 p. c.	50 Cc.	50.075	.....	Ph.	19.05 tn. "	$3Ca(OH)_2$
Maximum Alkalinity Limit.							
Potassium bromide	(0.07 p. c.)	.....	1.	10 Cc. H_2O, boil	Ph.	0.1 tn. H_2SO_4	$3K_2CO_3$
Sodium bromide	(0.053 ")	.....	1.	" "	"	0.1 " "	$3Na_2CO_3$
Potassium iodide	(0.07 ")	.....	1.	" "	"	0.1 " "	$3K_2CO_3$
Sodium iodide	(0.053 ")	.....	1.	" "	"	0.1 " "	$3Na_2CO_3$
Potassium hypophosphite	(1.03 ")	.....	1.	" "	M.-O.	1.5 " HCl	$3K_2CO_3$
Sodium hypophosphite	(0.79 ")	.....	1.	" "	"	1.5 " "	$3Na_2CO_3$
Sodium bicarbonate	(2.11 ")	.....	1.	20 Cc. H_2O (15° C.)	Ph.	0.2 n. "	$6Na_2CO_3$
Zinc carbonate	(0.53 ")	.....	1.	10 Cc. H_2O, boil	"	1. tn. "	$3Na_2CO_3$
Soap	(0.24 ")	.....	5.	50 Cc. H_2O	"	3. " $H_2C_2O_4$	6NaOH
Soap, soft	(0.25–0.5 p. c.)	.....	5.	" "	"	2.3–4.5 tn. $H_2C_2O_4$	6KOH

With Tenth-normal Silver Nitrate. V. S.

Substance.	U. S. P. Requirement.		Quantity.	Accessories and Solvents, Official Proportions.	Indicator.	Cc. V. S.	Ratio for Calc. 2 $AgNO_3$=
	Text.	From Titrations.					
Ammonium chloride	99.5 p. c.	(99.32–99.47)	0.1 Gm.	10 Cc. H_2O	K_2CrO_4	18.7–18.73	$2NH_4Cl$
Sodium chloride	99 "	(98.7–98.99)	0.1 "	10 " "	"	17–17.05	2NaCl
Ammonium bromide	97 "	([?]–102.48)	0.3 "	10 " "	"	(?)–31.6	$2NH_4Br$
Lithium bromide	97 "	(97.13–103.17)	0.3 "	30 " "	"	34.75–35.85	2LiBr
Potassium bromide	97 "	(96.94–101.86)	0.3 "	50 " "	"	24.6–25.85	2KBr
Sodium bromide	97 "	(97.13–102.24)	0.3 "	50 " "	"	28.5–30	2NaBr
Strontium bromide	97 "	(96.7–103.76)	0.3 "	30 " "	"	16.45–17.65	$SrBr_2 6H_2O$
Zinc bromide	97 "	(96.9–99.88)	0.3 "	10 " "	"	26–26.8	$ZnBr_2$
Ammonium iodide	97 "	(96.94–105.14)	0.5 "	—	"	33.7–36.55	$2NH_4I$
Potassium iodide	99 "	(98.86–101.49)	0.5 "	10 " "	"	30–30.8	2KI
Sodium iodide	98 "	(98.19–102.96)	0.5 "	10 " "	"	33–34.8	2NaI
Oil bitter almond	2–4 "	.....	1 Cc. 1.05 Gm.	50 Cc. H_2O, $Mg(OH)_2$	"	7.8-15.65	2HCN
Acid hydrocyanic dil	2 "	.....	3 Cc. 2.99 Gm.	50 Cc. H_2O, 5 Cc. NH_3	KI	11.15	4HCN
Potassium cyanide	95 "	....	0.5 Gm.	50 Cc. H_2O, 5 Cc. NH_3	KI	36.7	4KCN

A. III. Depending upon Oxidization

With Tenth-normal Iodine, $K_2Cr_2O_7$ and $K_2Mn_2O_8$ Vol. Solutions.

Substance.	Requirement U. S. P.	Quantity.	Accessories and Solvents. Official Proportion.	Indicator.	Cc. V. S.	Ratio for Calcul.
					Iodine V. S.	$4I =$
Arsenic trioxide	99.8 p. c.	0.1 Gm.	20 Cc. H_2O + 1 Gm. $NaHCO_3$	None.	20.3	As_2O_3
Arsenous acid solution	1 "	25 Cc. / 25 Gm.	100 Cc. H_2O + 2 Gm. $NaHCO_3$	"	50.75	As_2O_3
Potassium arsenite solution.	1 "	25 Cc. / 25 Gm.	75 Cc. H_2O, 3 Cc. dil. HCl + 2 Gm. $NaHCO_3$	"	50.75	As_2O_3
Arsenous iodide	99 "	0.5 Gm.	50 Cc. H_2O_1 + 2 Gm. $NaHCO_3$	"	21.9	$2AsI_3$
Antimony-potassium tartrate	99.5 "	0.5 Gm.	50 Cc. H_2O + 30 Cc. cold sat. $NaHCO_3$	Starch.	30.15	$(KSbOC_4H_4O_6)_2H_2O$
Sodium thiosulphate	98 "	1. Gm.	20 Cc. H_2O	None.	39.75	$4(Na_2S_2O_35H_2O)$
					$K_2Cr_2O_7$ V. S.	$K_2Cr_2O_7 =$
Ferrous carbonate, saccharated	15 p. c.	1 Gm.	90 Cc. H_2O + 10 Cc. dil. H_2SO_4	$K_6Fe_2(CN)_{12}$	13.05	$6FeCO_3$
					$K_2Mn_2O_8$ V. S.	$K_3Mn_2O_8 =$
Ferrous sulphate, crystalline	99.5 p. c.	1 Gm.	20 Cc. dil. H_2SO_4	None.	36.05	$10(FeSO_4\ 7H_2O)$
Ferrous sulphate, granulated	99.5 "	1 Gm.	20 Cc. " "	"	36.05	" "
Ferrous sulphate, dried	——	1 Gm.	30 Cc. " "	"	55.5–56.35	$5([FeSO_4]_2.3H_2O)$
Hydrogen dioxide solution.	3 p. c.	2 Cc. / 2 Gm.	20 Cc. H_2O + 5 Cc. dil. H_2SO_4	"	35.55	$5H_2O_2$

A. IV. Depending upon Reduction.

With Tenth-normal Sodium Thiosulphate V. S.

Substance.	Requirement U. S. P.	Quantity.	Accessories and Solvents, Official Proportions.	Indicator.	Cc. V. S.	Ratio for Calcul., $6Na_2S_2O_35H_2O$ =
Iodine	99 p. c.	0.5 Gm.	50 Cc. H_2O + 1 Gm. KI	none	39.3	6I
Iodine sol., comp.	5 "	5 Cc. (5 Gm.)	.....	"	19.85	6I
Iodine tincture	6.86 Gm. in 100 Cc.	5 Cc.	25 Cc. H_2O	"	27.25	6I
Sulphur iodide	70.5 p. c.	0.5 Gm.	20 " " + 1 Gm. KI	starch	28.	6Cl
Lime, chlorinated	30 "	0.5 Gm.	125 " " + 1.5 " " + 3 Cc. HCl	none	42.65	6Cl
Soda chlorinat., solution	2.4 "	5 Cc. (5.25 Gm.)	35 " " + 1.5 " " + 10 " "	"	35.85	$2Cro_3$
Chromium trioxide	90 "	0.1 Gm.	10 " " + 1 " " + 2 " "	starch	27.2	6Fe
Ferric chloride	22 "	0.5 "	50 " " 2 " " 3 " "	none	19.8	6Fe
" citrate	16 "	0.5 "	15 " " 1 " " 2 " "	starch	14.4	6Fe
" ammon. citr	16 "	0.5 "	15 " " 1 " " 2 " "	"	14.4	6Fe
" ammon. sulph	11.5 " / 99.18 "	0.5 "	15 " " 1 " " 2 " "	none	10.35	$6Fe(NH_4)(SO_4)_212H_2O$
" ammon. tartrate	13 "	0.5 "	15 " " 1 " " 2 " "	starch	11.7	6Fe
" potass. tartrate	15 "	0.5 "	15 " " 1 " " 2 " "	"	13.5	6Fe
" phosphate soluble	12 "	0.5 "	50 " " 1 " " 2 " "	none	10.8	6Fe
" pyrophosphate sol	10 "	0.5 "	50 " " 2 " " 8 " "	"	9.	6Fe
" chloride solution	10 " / 29 "	1 Cc. (1.315 Gm.)	15 " " 2 " " 3 " "	starch	23.7	6Fe / $6FeCl_3$
" sulphate solution	10 " / 35.77 "	1 Cc. (1.432 Gm.)	15 " " 2 " " 3 " "	"	25.8	6Fe / $3Fe_2(SO_4)_3$
" subsulphate solution	13.57 "	1 Cc. (1.548 Gm.)	15 " " 2 " " 3 " "	"	27.9	6Fe
" chloride tincture	4.60 " / 13.28 "	2 Cc. (2.01 Gm.)	Remove alcohol, oxidize ferrous salt, then 20 Cc. H_2O, 1 Gm. KI, 1 Cc. HCl	" / "	16.65	6Fe / $6FeCl_3$
" quinine citrate	13.5 "	2 Gms.	Remove alkaloid, etc., dil. to 100 Cc.; to 25 Cc. add 1 Gm. KI, 3 Cc. HCl.	"	4×12.4	6Fe
" quinine citrate sol.	13.5 "	2 "		"	4×12.4	6Fe
" strychnine citrate	16 "	5 "	Remove alkaloid, etc., dil. to 100 Cc.; to 25 Cc. add 1 Gm. KI, 4 Cc. HCl.	.....	4×36.05	6Fe

B. Residual Titrations.

Under this heading are included not only those determinations in which two volumetric solutions are used, but also those in which it is necessary to make a blank test to determine the action of an accessory reagent upon the volumetric solution employed, as in aldehyde determination with sodium sulphite, etc.

B. 1. Depending upon Neutralization.

a. Excess Normal Acid V. S., Excess of which is Determined with Normal KOH V. S.

Substance.	Requirement U. S. P.	Quantity.	Solvent and n. Acid V. S. Added.	Indicator.	Cc. n. KOH V. S.		Ratio for Calcul., 6KOH =
					For Excess.	= Substance.	
Ammonium carbonate.	97 p. c.	1 Gm.	25 Cc. H_2O + 25 Cc. H_2SO_4, boil	Lit.	6.35	18.65	$2(NH_4HCO_3NH_4NH_2CO_2)$
Magnesium carbonate.	38.4 p. c.	1 Gm.	25 Cc. H_2SO_4	M.-O.	5.8	19.2	$3MgO$
Lithium carbonate....	98.5 "	0.5 Gm.	20 Cc. "	"	6.6	13.4	$3Li_2CO_3$
Magnesium oxide	81.6 "	0.5 Gm.	25 Cc. "	"	4.6	20.4	$3MgO$
Zinc oxide.....	99 "	1 Gm.	30 Cc. HCl	"	5.5	24.5	$3ZnO$

b. Excess tenth-normal H_2SO_4 V. S., excess of which is determined with fiftieth-normal KOH V. S.

Drugs or Preparations.	Requirement U. S. P.	Quantity.		Water and Cc. tn. H_2SO_4 Added.	Indicator.	Cc. Fiftieth n. KOH.		Ratio for Calcium. 2KOH =
		Start.	Finish.			For Excess.	= Alkaloid.	
Aconite	0.5 p. c.	10 Gm.	10 Gm.	3 Cc. H_2SO_4	Coch.	11.1	3.9	$2C_{34}H_{47}NO_{11}$
Aconite fluidextract...	0.4 Gm.	10 Cc.	10 Cc.	3 Cc. H_2SO_4, 20 Cc. H_2O	"	11.9	3.1	" "
Aconite tincture.....	0.045 Gm.	100 Cc.	100 Cc.	" " "	"	11.5	3.5	" "
Belladonna leaves	0.3 p. c.	10 Gm.	10 Gm.	3 Cc. H_2SO_4	Coch.; Iod.	9.75	5.25	$2C_{17}H_{23}NO_3$

b. EXCESS TENTH-NORMAL H_2SO_4 V. S., EXCESS OF WHICH IS DETERMINED WITH FIFTIETH-NORMAL KOH V. S.—*Concluded.*

Drugs or Preparations.	Requirement U. S. P.	Quantity.		Water and Cc. tn. H_2SO_4 Added.	Indicator.	Cc. Fiftieth-n. KOH.		Ratio for Calcul., 2KOH.
		Start.	Finish.			For Excess.	= Alkaloid.	
Belladonna extract	1.4 p. c.	2 Gm.	2 Gm.	3 Cc. H_2SO_4	Coch.; Iod.	10.1	4.9	$2C_{17}H_{23}NO_3$
Belladonna plaster	0.38–0.42 p. c.	10 "	10 "	" "	Coch.	7.7–8.35	6.65–7.3	"
Belladonna tincture	0.03 Gm.	100 Cc.	100 Cc.	" "	Coch.; Iod.	9.75	5.25	"
Belladonna root	0.45 p. c.	10 Gm.	10 Gm.	" "	" "	7.15	7.85	"
Belladonna fluidextract	0.4 Gm.	10 Cc.	10 Cc.	" "	" "	8.	7.	"
Hyoscyamus	0.08 p. c.	25 Gm.	25 Gm.	" "	" "	11.5	3.5	"
Hyoscyamus extract	0.3 "	5 "	5 "	" "	" "	12.35	2.65	"
Hyoscyamus fluidextr.	0.075 Gm.	25 Cc.	25 Cc.	" "	" "	11.7	3.3	"
Hyoscyamus tincture	0.007 "	250 "	250 "	" "	" "	11.95	3.05	"
Scopola	0.5 p. c.	10 Gm.	10 Gm.	" "	" "	6.25	8.75	"
Scopola extract	2 "	2 "	2 "	" "	" "	8.	7.	"
Scopola fluidextract	0.5 Gm.	10 Cc.	10 Cc.	" "	" "	6.25	8.75	"
Stramonium	0.25 p. c.	10 Gm.	10 Gm.	" "	" "	10.6	4.4	"
Stramonium extract	1 "	2 "	2 "	" "	" "	11.5	3.5	"
Stramonium fluidextr.	0.25 Gm.	10 Cc.	10 Cc.	" "	" "	10.6	4.4	"
Stramonium tincture	0.025 Gm.	100 "	100 "	" "	" "	10.6	4.4	"
Coca	0.5 p. c.	10 Gm.	10 Gm.	" "	" "	6.65	8.35	$2C_{17}H_{21}NO_4$
Coca fluidextract	0.5 Gm.	10 Cc.	10 Cc.	" "	" "	6.65	8.35	"
Ipecac	1.75 p. c.	15 Gm.	10 Gm.	10 Cc. H_2SO_4	Coch.	13.25	36.75	$(C_{15}H_{21}NO_2 + C_{14}H_{19}NO_2)$
Ipecac fluidextract	1.5 Gm.	10 Cc.	10 Cc.	" "	"	18.50	31.50	$(C_{15}H_{21}NO_2 + C_{14}H_{19}NO_2)$
Nux vomica	1.25 p. c.	20 Gm.	10 Gm.	5 Cc. H_2SO_4 + 80 Cc. H_2O	Iod.	6.15	18.85	$2C_{21}H_{22}N_2O_2$
Nux vomica extract	5 "	2 "	2 "	5 " " 90 " "	"	9.9	15.1	"
Nux vomica fluidextr.	1 Gm.	10 Cc.	10 Cc.	5 " " 80 " "	"	9.9	15.1	"
Nux vomica tincture	0.1 Gm.	100 "	100 "	5 " " 90 " "	"	9.9	15.1	"
Physostigma	0.15 p. c.	20 Gm.	10 Gm.	2 " " 80 " "	"	7.25	2.75	$2C_{15}H_{21}N_3O_2$
Physostigma extract	2 "	2 "	1 "	2 " " 90 " "	"	6.3	3.7	"
Physostigma tincture	0.014 Gm.	100 Cc.	50 Cc.	2 " " 90 " "	"	8.7	1.3	"
Pilocarpus	0.5 p. c.	10 Gm.	10 Gm.	5 Cc. H_2SO_4	Coch.; Iod.	12.9	12.1	$2C_{11}H_{16}N_2O_2$
Pilocarpus fluidextract	0.4 Gm.	10 Cc.	10 Cc.	" "	" "	15.3	9.7	"

C. EXCESS AQUEOUS ALKALINE V. S. EXCESS OF WHICH IS DETERMINED BY H_2SO_4 V. S.

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories and Alkali V. S.	Indicator.	Cc. H_2SO_4 V. S. For Excess.	Cc. H_2SO_4 V. S. =Substance.	Ratio for Calc. H_2SO_4 =
Formaldehyde solution	37 p. c.	3	3.234	50 Cc. n NaOH + 50 Cc. neutr. H_2O_2	Lit.	9.8 Cc. n	40.2 Cc. n	$2CH_2O$
Acid sulphuric, arom.....	20 "	10	9.330	30 Cc. H_2O, boil 4 hrs.; 50 Cc. n KOH	M-O	11.7 Cc. n	38.3 Cc. n	H_2SO_4
Maximum Acidity Limit.								
Hydrogen dioxide solution.	.....	25	25	5 Cc. tn KOH, evap. to 10 Cc.	Ph.	2.5 Cc. tn	2.5 Cc. tn	.....

d. 1. EXCESS ALCOHOLIC HALF-NORMAL KOH V. S. EXCESS DETERMINED WITH HALF-NORMAL HCL V. S.

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories and Cc. h-n Alcoholic KOH V. S.	Indicator.	Cc. h-n HCl V. S. For Excess.	Cc. h-n HCl V. S. =Substance.	Ratio for Calc. HCl =
Oil peppermint	6 p. c.	10	9.	25 Cc. h-n KOH, boil 1 hour.	Ph.	19.5	5.5	$C_{10}H_{19}C_2H_3O_2$
Oil rosemary	2.5 "	10	9.	25 " " " " " "	"	22.65	2.35	$C_{10}H_{17}C_2H_3O_2$
d. 2. As Above After Acetylization.								
Oil peppermint	50 p. c.	5	.....	50 Cc. h-n KOH, boil 1 hour.	Ph.	.....	.....	$C_{10}H_{19}OH$
" rosemary	10 "	5	.....	50 " " " " " "	"	.....	.....	$C_{10}H_{17}OH$
" santal	90 "	3	.....	50 " " " " " "	"	.....	.....	$C_{15}H_{26}OH$

d. 3. AS ABOVE. SAPONIFICATION FIGURES: MGM. KOH FOR 1 GM. SUBSTANCE.

Substance.	Quantity. Cc.	Quantity. Gm.	Accessories and Cc. h-n. Alcoholic KOH V. S.	Indicator.	Cc. h-n. Acid V. S. For Excess.	Cc. h-n. Acid V. S. = Substance.	Requirement U. S. P.
Oil almond expr.	3 Cc.	2.5 Gm.	25 Cc. h-n. KOH, boil ½ hr.	Ph.	7.05- 7.85	17.15-17.95	191-200
" castor	3 "	2.5 "	"	"	8.6 - 8.95	16.05-16.4	179-183
" codliver	3 "	2.5 "	"	"	8.4 - 9.3	15.7 -16.6	175-185
" cottonseed	3 "	2.5 "	"	"	7.4 - 7.85	17.15-17.6	191-196
" croton	3 "	2.5 "	"	"	5.7 - 6.8	18.2 -19.3	203-215
" lard	3 "	2.5 "	"	"	7.35- 7.5	17.5 -17.65	195-197
" linseed	3 "	2.5 "	"	"	7.5 - 8.25	16.75-17.5	187-195
" olive	3 "	2.5 "	"	"	7.5 - 7.85	17.15-17.5	191-195
" rose *	3 "	2.5 "	20 Cc. h-n. KOH, boil ½ hr.	"	18.5 -19.1	0.9 - 1.5	10-17
" theobroma	.....	2.5 "	25 Cc. "	"	7.5 - 8.15	16.85-17.5	188-195
Wax, yellow	.....	2.5 "	"	"	16.4 -16.9	8.1 - 8.6	90-96
Balsam tolu *	.....	1 "	20 Cc. "	"	13.2 -14.5	5.5 - 6.8	153-189
Resin, jalap *	.....	1 "	25 Cc. h-n. KOH, 50 Cc. Alc., boil 1 hr.	"	20 -(?)	(?) - 5	(?)-139
Cinnamein (from Balsam Peru)	.....	1.4 "	25 Cc. h-n. KOH, 25 Cc. Alc., boil ½ hr.	"	(?) -13.2	11.8 -(?)	235-(?)

* Half-normal H_2SO_4 V. S. instead of HCl V. S.

e. NaOH LIBERATED FROM Na_2SO_3 AND DETERMINED WITH HALF-NORMAL HCl V. S.

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories, etc.	Indicator.	Cc. h-n HCl V. S. for liber. NaOH.	Ratio for Calc. 2 HCl =
				In boiling water-bath:			
Cinnaldehyde	95 p. c.	0.5	0.5	5 Cc. H_2O, neutr. tn. NaOH + 50 Cc. Na_2SO_3 (20 p. c.).	Ros.	14.5 Cc.	C_9H_8O
Oil lemon	4 p. c.	15	14	5 Cc. H_2O, neutr. tn. NaOH + 25 Cc. Na_2SO_3 (20 p. c.).	Ph.	15 Cc.	$C_{10}H_{16}O$
				Let stand 2 hours without heat:			
Benzaldehyde	85 p. c.	0.5	0.5	10 Cc. kerosene, 20 Cc. H_2O, neutr. tn. NaOH, add	Ros.	8.1 Cc.	$2C_7H_6O$
Oil bitter almond	85 p. c.	0.5	0.5	10 Cc. Na_2SO_3 (20 p. c.) in portions.	Ros.	8.1 Cc.	$2C_7H_6O$

B. II. Depending upon Precipitation.

Excess tenth-normal $AgNO_3$ V.S., excess determined by tenth-normal KCNS V.S.; or
Excess tenth-normal NaCl V.S., excess determined by tenth-normal $AgNO_3$ V.S.

Substance.	Requirement U. S. P.		Quantity.		Accessories and Cc. tn. $AgNO_3$ V.S.	Indicator.	Cc. KCNS V.S.		Ratio for Calcul., 2KCNS =
	Text.	Titrations.	Cc.	Gm.			For Excess.	= Substance.	
						Fe Alum.			
Strontium iodide	98 p. c.	97.7–103.9	—	0.5	25 Cc. $AgNO_3$, 100 Cc. H_2O, 5 Cc. HNO_3	5 Cc.	1.7–3.1	21.9–23.3	$SrI_2 6H_2O$
Zinc iodide	98 "	98.2–100.1	—	0.5	35 Cc. $AgNO_3$, 20 Cc. H_2O, 5 Cc. HNO_3	3 "	3.4–4.	31–31.6	ZnI_2
Syr. ferrous iodide....	5 "	——	2	2.698	15 Cc. $AgNO_3$, 30 Cc. H_2O, 2 Cc. dil. HNO_3	2 "	6.25	8.75	FeI_2
Syr. hydriod. acid	1 "	——	10	11.9	15 Cc. $AgNO_3$, 30 Cc. H_2O, 5 Cc. dil. HNO_3	3 "	5.65	9.35	2HI
Acid hydriod., dil.	10 "	——	2	2.212	25 Cc. $AgNO_3$, 50 Cc. H_2O, 3 Cc. HNO_3	3 "	7.6	17.4	2HI
Acid hydrobrom., dil. .	10 "	——	2	2.152	35 Cc. $AgNO_3$, 50 Cc. H_2O, 3–4 Cc. HNO_3	5 "	8.25	26.75	2HBr
Oil mustard, vol.	92 "	92.49 p. c.	0.1	0.102	30 Cc. $AgNO_3$, 5 Cc. alcohol, 5 Cc. NH_3, &c.; filter, wash, add 4 Cc. HNO_3	Few drops.	10.85	19.15	C_3H_5NCS
					Cc. tn. NaCl V.S.	K_2CrO_4	Cc. $AgNO_3$ V.S.		$AgNO_3$ =
Silver nitrate, cryst. ..	99.9 p. c.	——	—	0.5	30 Cc. NaCl, 10 Cc. H_2O	"	0.4	29.6	$AgNO_3$
Silver nitrate, moulded.	94.8 "	——	—	0.5	" " " "	"	1.9	28.1	"
Silver nitrate, mitigat.	33.3 "	——	—	1.	20 Cc. NaCl, 10 Cc, H_2O	"	0.3	19.7	"

B. III. Depending upon Oxidation.

Excess tenth-normal $H_2C_2O_4$ V. S. is used as a precipitant or reducing agent, and excess of this determined with tenth-normal $K_2Mn_2O_8$ V. S.

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories and Cc. tn. Vol. Solution.	Indicator.	Cc. $K_2Mn_2O_8$ V. S. For Excess.	Cc. $K_2Mn_2O_8$ V. S. =Substance.	Ratio for Calc. $2K_2Mn_2O_8$=
Potass. permangan ...	99 p. c.	.....	0.1	100 Cc. H_2O, 5 Cc. H_2SO_4, 35 Cc. $H_2C_2O_4$ V. S.	none	3.5	31.5	$2K_2Mn_2O_8$
Manganese diox. prec..	80 "	.....	0.2	100 " " 3 " " 50 " "	"	12.95–13	37–37.05	$10MnO_2$
Lead subacet. solution.	25 "	1	1.235	10 Cc. H_2O, 35 Cc. $H_2C_2O_4$ V.S. dil. to 50 Cc. filter and take 25 Cc. + 5 Cc. H_2SO_4	"	2×6.15	22.7	$5Pb_2O(C_2HO_2)_2$
Sodium nitrite	90 "	.....	0.1	100 Cc. H_2O, 35 Cc. $K_2Mn_2O_8$ V. S. 5 Cc. H_2SO_4 after 5 min. 10 Cc. $H_2C_2O_4$ V. S.	.....	1.25	26.25	$10NaNO_2$

B. IV. Depending upon Reduction.

a. Excess Iodine, or tenth-normal Iodine V. S. or Bromine V. S. added and excess determined with tenth-normal Sodium Thiosulphate V. S.

Substance.	Requirement U. S. P.	Quantity. Cc.	Quantity. Gm.	Accessories, Cc. tn Vol. Solution.	Indicator.	Cc. $Na_2S_2O_3$ V. S. For Excess.	Cc. $Na_2S_2O_3$ V. S. =Substance.	Ratio for Calc. $6(Na_2SO_35H_2O)$
Acid sulphurous.....	6 p. c.	2	2.056	50 Cc. tn I. V. S., after 5 min.	none	11.2	38.8	$3SO_2$
Sodium bisulphite	90 "	.....	0.25	Dissolve in 50 Cc. tn I. V. S. after 1 hour.	"	6.45	43.55	$3NaHSO_3$
Sodium sulphite.....	94 "	.....	0.5	" " 50 " " " " "	"	12.45	37.55	$3(Na_2SO_37H_2O)$
Iron reduced	90 "	.....	0.2	1 Gm. iodine, 1 Gm. KI, 5Cc. H_2O after 1 hour.	"	13.75	64.85	3Fe
Phenol.....	96 "	.....	0.1	10 Cc. H_2O, 75 Cc. tn Br V. S. 10 Cc. HCl.	"	13.3	61.7	C_6H_5OH

b. IODINE FIGURES OF OILS, ETC. EXPRESSED IN PERCENTAGE OF IODINE TAKEN UP.

Substance.	Requirement U. S. P.	Quantity.	Accessories, etc.	Cc. tn. $Na_2S_2O_3$ V. S. = substance.
Oil almond expr	95–100	0.3 Gm.	Dissolve in 10 Cc. $CHCl_3$, add 25 Cc. Hübl's solution, let stand 4 hours, when solution must still be quite dark, showing sufficient excess of I; then 20 Cc. KI (20 p. c.), 50 Cc. H_2O, and titrate with tn. $Na_2S_2O_3$ V. S.	22.65–23.80
" codliver	140–150	"		33.35–35.75
" cottonseed	102–108	"		24.3 –25.75
" croton	103–109	"		24.55–25.95
" lard	56–74	"		13.35–17.65
" olive	80–88	"		19.05–20.95
" theoboma	33–38	0.8 Gm.		20.95–24.15
" castorr	84–89	0.3 Gm.	As above, but let stand 8 hours.	20 –21.2
" linseed	not less 170	0.15 Gm.	As above, but let stand 16 hours.	20.25–(?)

C. DETERMINATIONS EXPRESSED IN PERCENTAGE BY VOLUME.

Substance.	Requirement U. S. P.	Quantity.	Reagents, etc.	Vol. Insol.	Vol. Soluble.
Oil cloves	80 p. c. phenol.	10 Cc.	100 Cc. KOH (5 p. c.), agitate and let stand.	2 Cc.	8 Cc.
" pimenta	65 p. c. phenol.	10 "	100 Cc. KOH (5 p. c.), agitate and let stand.	3.5 "	6.5 "
" thyme	20 p. c. phenol.	10 "	40 Cc. NaOH (5 p. c.), agitate and let stand.	8 "	2 "
" cinnamon	75 p. c. aldehyde.	10 "	$NaHSO_3$ (30 p. c.), agitate, warm, and let stand.	2.5 "	7.5 "
" turpentine	93 p. c. soluble.	5 "	20 Cc. H_2SO_4, mix and keep cool, and let stand.	0.35 "	4.65 "
				Volume Liberated.	
" cajuput	55 p. c. cineol.	10 "	50 Cc. benzin; cineol ppd. by H_3PO_4, washed with benzin, and again liberated by adding hot H_2O and measuring.	5.5 Cc.	
" eucalyptus	50 p. c. cineol.	10 "	As above.	5 Cc.	

COMMENTS ON THE VOLUMETRIC DETERMINATIONS.

The advantages of this arrangement must be so evident that extended comments are unnecessary. The most important change consists in weighing accurately specified volumes of liquids,* and in doing away, in all but four cases, with taking aliquot portions (alkaloidal scale salts of iron and Goulard's extract); minor changes have been made so as to place like substances together, but the various degrees of solutions and varying quantities of accessory reagents in the assay of similar substances should be studied and harmonized if possible (note in the cases of acids, iron salts, haloid salts, etc.).

Instead of Cc. V. S., the acidity of, and saponifiable matter in, fats, resins, balsams, can be uniformly expressed as acid and saponification figures, respectively; balsam of tolu furnishes the only official illustration in which these two determinations are made in one portion taken.

The tabular arrangement shows the advantage of using the one V. S. for the same kind of determinations; under the organic salts of K and Na HCl has replaced H_2SO_4 a few times, while under saponification figures the reverse is true.

Magnesium oxide and carbonate need not be ignited before the titration.

In the *alkaloidal assays* considerable differences in the volume of the required V. S. have been eliminated by changing the initial quantity; in titrations in which other indicators than iodeosin are specified, water is directed to be used with the acid V. S. only in the case of the two aconite preparations. The table shows the U. S. P. in some cases allows as much as 20 per cent. difference in the strength of the drug and its fluidextract, lesser difference in the tinctures; in other cases the relative strength is the same, and no allowances made.

Haloid Salts. The high percentages obtained by calculation from the V. S. used is due to the presence of chlorides in the bromides and iodides. Hydrobromic acid is determined like HI by residual titration; the tendency of AgBr and AgI to carry Ag_2CrO_4 down in neutral solution, suggests the determination of all bromides and iodides by residual titration, but to prevent another source of error, the interaction of haloid Ag salts with KCNS, by which the end-reaction always fades away, the precipitated silver salts should be filtered out, thoroughly washed, and the excess of $AgNO_3$ determined in the filtrate.

Essential Oils. Phenolpthalein is still retained as indicator in citral valuation of oil lemon. The centrifuge has given very good results in the assays of oils of cloves, pimenta, thyme and cinnamon (Am. Journ. Pharm., July, 1909).

* Of strong acids 3 Cc., and of dilute acids, 10 Cc., are essentially weighed and taken for neutralization; the same lines as the benzaldehyde assay, in which a given number of drops are weighed. could be advantageously followed in the iodine-figure determinations by stating the number of drops of oil which will give approximately the weight desired. In order to calculate the volume of V. S. required for the definite weight, I had in the tables to use 0.1, 0.5, 1 Cc., etc., etc., but in practice the taking of a number of drops for a small quantity will be preferable.

MINUTES

OF THE

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

First Session—Thursday Afternoon, August 19, 1909.

The Section was called to order at 3 o'clock p. m., by Chairman L. A. Seltzer, of Detroit, and in the absence of Secretary E. Fullerton Cook, the Chair called on M. I. Wilbert to act as Secretary, and he did so. Otto Raubenheimer, Associate on the Committee, was also absent.

The Chair called on Charles W. Tobey, of Ohio, to preside while he read his address:

CHAIRMAN'S ADDRESS.

Upon accepting the responsibilities of this Section a year ago your Chairman was somewhat doubtful as to his ability to perform the duties of this office. After a year's labor he is about to submit the results of his work for your acceptance or disapproval.

In looking back over the history of this Section the problem which the founders tried hardest to solve, and the one which has existed ever since, recognized to a greater or lesser degree by various Chairmen, has been that of awakening an interest of individual members in its work. This problem still remains unsolved. Not that there has been any difficulty in getting a limited number of members interested to the extent of previding for a program, but that the essential purpose for which this Section was established, that of interesting the rank and file of the Association through the means of a Section, in the transactions of which every dispensing pharmacist is especially interested and can take active part, is still almost as far from being realized as in the beginning.

This may be partially due to the fact that, to some extent at least, the plan of conducting this Section is similar to that of conducting the other Sections. Now in view of the fact that the number we try to reach in this Section is almost as large as the membership of the Association, it is evident that the method of the Chairman should be systematic, and that he should have some machinery, so to speak, at his disposal so that he could come into personal communication with every member of the Association for the good of the Association and the tremendous benefit of the members themselves.

Several methods have been tried, as that of writing to a large number of members, that of writing to a number of members, selecting such as would probably respond, and

that of sending out invitations to take part with the annual volume of proceedings. During the last year your Chairman tried writing to several of the most prominent members in each State and province represented in our membership, asking them either to contribute themselves or send names of such in their locality who would be able or willing to contribute. The result of this plan was like the rest, somewhat "disappointing," if not "discouraging." Another form of systematic endeavor was that of interesting local branches in the work of the Section. While this was only partially successful, it would seem to be a step in the right direction, the advantages of a closer relationship between the Association and its local branches resulting from co-operation in the same work are so many and so manifest as to render their recounting unnecessary.

There is another means which would seem to be feasible whereby the members could be communicated with. The treasurer sends at least one letter to each member each year. In this letter might be enclosed a circular to the members if desired. This matter has been dwelt upon at considerable length, not only on account of the value to members to be vitally interested in the work of the Section and the value to the Association to have its members so interested, but because your Chairman feels that partially on account of the lack of such systematic means he has missed a great opportunity of accomplishing the work that was laid out for him to do and fallen far short of the results that were to be had if they had been pursued in the right way and by the right means.

The work this year was directed toward the betterment of the Formulary. It was the earnest desire of the Association to utilize the enormous wealth of resources scattered all over the country in the shops of our members. A chairman was selected who was a member of the Formulary Committee in order to emphasize this desire of the Association, and while the papers that we are able to present are of high order and great value, the fact remains that owing to the means employed the surface of this mine of detailed knowledge which exists in this Association has hardly been scratched.

If, however, our shortcoming has been brought home sufficiently so that we shall organize our forces that we may utilize them in whatever way we see fit, the lesson will be well learned. Organization is the order of the day. An inch in the direction of organized effort is better than a foot spurt of independent progress; the former can be maintained, the latter seldom is.

Perhaps one of the most important works fostered by the Association this year is the revision of the Formulary. Many workers have toiled and striven for the advancement of this work so as to reflect as much credit as possible on the American dispenser. There seems to be a feeling that since the Formulary has become a national standard it should confine itself as much as possible to strictly medicinal preparations, leaving all minor formulas as those of toilet preparations and other recipes to pharmacists themselves.

There are some important problems still unsolved, as, for instance, the standardization of coloring substances. It is to be hoped that some one in the Association, even if not a member of the committee, will be able to suggest a plan for solving this difficulty.

Work has also been done on making pleasant flavoring elixirs, and this suggests the fact that although many of the operations which, owing to the advances in scientific work along pharmaceutical lines, are not feasible for the dispensing pharmacist to attempt, he can still practice his *art*. In fact it is rather by excelling in his art than in any other way that the dispensing pharmacist can distinguish himself in the eyes of the laity as well as the profession. The pendulum is swinging back almost to where it was of old when the art was the most important part of pharmaceutical knowledge and practice.

Along the line of the investigation by pharmacists of color standards and flavor elixirs should go the combinations of odors. In how many shops is otto of rose almost the only available means of scenting such preparations as need it? To what extent is the knowledge of combining and producing odors common among pharmacists? This

knowledge is valuable and within the reach of all, and work along this line is suggested. Reports or papers on this subject would be interesting and helpful.

Not least in the *art* might be mentioned the manner in which prescriptions are delivered to the public. The use of a too limited variety of bottles, ointment jars and pill boxes is common. The use of cheaply-printed labels or of lithographed labels as found displayed in label catalogues, illustrating every form of natural phenomena from a cloudburst to a cyclone, or a picture of various utensils used in a drug store, should be avoided. He who would aspire to attract attention to superior work can do so first of all by the use of artistic, dignified labels nicely written, the use of containers best suited for the particular prescription, sometimes an ointment jar, sometimes a collapsible tube, wide and narrow-necked bottles, sprinkle-top corks when needed or perforated-top jars when required for convenience, novelties in pill and capsule containers, all these are legimate means and wholesome practice for the pharmacist who tries to do his work a little better than the rest.

The Section is especially indebted for the program about to be presented to the loyal work of its enthusiastic associate and able secretary without whose support the work would have fallen far short of its present fulfillment.

Mr. Seltzer, recurring to the subject of containers mentioned in his address, explained the character and advantages of a uniform series of pill- and powder-boxes he had adopted in his store, exhibiting samples of the same to the members. He also called attention to and showed the working of what he said he considered the best dropping-bottle he had ever seen, one that was practical and clean, and that held half an ounce. The bottle had a rubber bottom in it.

Mr. Seltzer resumed the chair, and the reading of papers being the next in order of business, he called on Mr. Dunn, of Brooklyn, to read a paper on Abstracts from the Squibb Laboratory Note Books, and Mr. Dunn presented his subject as follows:

SUGGESTED MODIFICATIONS OF U. S. P. AND N. F. FORMULAS.

BY JOHN A. DUNN, BROOKLYN, N. Y.

The revival of interest in official preparations on the part of doctors and druggists has naturally caused considerable activity among manufacturing pharmacists, most of whom felt not only the desirability but the practical necessity of presenting to the Trade strictly official preparations which would be in every way acceptable. This has resulted in the publication of many criticisms of the official preparations and many suggestions as to how they might be improved. All of these criticisms and suggestions that are made in the proper spirit must be welcomed by those who have the interest of the Pharmacopoeia and National Formulary at heart.

These abstracts from our laboratory note books are for the most part slight, but we think important modifications of the original formulas as found in the Eighth Edition of the U. S. Pharmacopoeia, and the Third Edition of the National Formulary. Most of them were worked out during the past two years by different

members of our laboratory force. A few of them have already appeared in print in the pages of the Bulletin of our Association, but we have thought it best to include them in this brief abstract.

Before reading them I will pause for a moment to say that the various formulas were carefully tried in their original form and only when found unsatisfactory was an attempt at modification resorted to. And in this connection I would also remind you that these are but a few of the many formulas embodied in the pages of the works mentioned, and that both works as a whole will stand as a credit to all those engaged in their production and compilation.

Let us consider first preparations of the Pharmacopoeia.

DILUTED HYDRIODIC ACID.

The following formula, while rather more trouble to carry out, gives a much cleaner preparation than the U. S. P.:

Solution of Iron Iodide, N. F.	150	Cc.
Barium Hydrate Crystals	125	Gm.
Sulphuric Acid, U. S. P., about	42.2	Gm.
(Diluted with water to 100 Gm.)		
Acid, Hypophosphorous, Dil.	50	Gm.
Distilled Water, q. s. to make 1000 Gm.		

To the solution of iodide of iron add the barium hydrate crystals dissolved in 500 Cc. hot water. Keep hot for one-half hour, drain on cloth and wash magma till free from barium iodide. Concentrate solutions and washings to 400 Cc., add enough hydrogen sulphide solution to remove all iron, filter and feed in the sulphuric acid with constant stirring until the solution contains a very slight excess of sulphuric acid. Let settle 6 or 8 hours, or over night, draw off clear liquor, add 200 Cc. water, stir, and let settle again and draw off. Repeat washing of barium sulphate once more in same way. Combine all the washes, add the dilute hypophosphorous acid, assay, and add sufficient water to make the product assay 10 per cent.

OLEIC ACID.

The congealing point of the U. S. P., 1900, has too wide a range. The oleate of mercury made with an oleic acid congealing at about 4° C. (39.2° F.), and another made from an acid congealing at about 9° C. (48.2° F.), would vary much in consistency. It is possible for a pharmacist to make an acid prepared according to the statement of the U. S. P., namely, by cooling commercial oleic acid to 5° C. (41° F.), then separating the liquid portion which will conform to the U. S. P., 1890, standard of about 4° C. (39.2° F.).

ACID SULPHURIC AROMATIC.

We still continue to adhere to our modification of the U. S. P., 1860, formula for this preparation in preference to the present official preparation. I will not take up time in comparing the two formulas but get at once to the modification. This consists in simply mixing the sulphuric acid with a portion of the alcohol and percolating the spices with the cooled mixture, holding back just enough of the alcohol to displace the remaining acid mixture from the spices. The process is a simple and easy one, and the product pharmaceutically unobjectionable and we believe therapeutically superior.

CATAPLASM KAOLIN.

By the U. S. P. formula as it stands we are not able to make a satisfactory preparation. The preparation made by it is not smooth enough and will separate. The following formula gives an easy way of introducing the boric acid, and when mixing has been thorough, a very smooth product results:

Kaolin	555 Gm.
Glycerite of Boroglycerin	261 Gm.
Glycerin	181 Gm.
Methyl Salicylate	2 Gm.
Thymol	0.5 Gm.
Oil of Peppermint	0.5 Gm.

Proceed as directed in the U. S. P., except that the glycerite of boroglycerin and glycerin are added at the same time.

CERATE CANTHARIDES.

The formula of the 1890 U. S. P., which uses oil turpentine instead of the liquid petrolatum of the 1900 U. S. P. formula, gives a much more potent preparation.

COLLODION.

The formula we suggest gives a collodion which is more contractile than the U. S. P., due to a decrease in pyroxylin. We reduce the pyroxylin 50 per cent. The formula is:

Pyroxylin	20 Gm.
Ether	750 Cc.
Alcohol	250 Cc.

COLLODION FLEXIBLE.

In this preparation we omit the Canada turpentine to avoid the possibility of irritation from its use. We recommend the following formula:

Pyroxylin	50 Gm.
Ether	720 Cc.
Alcohol	230 Cc.
Castor Oil	50 Cc.

This gives a very white and flexible film.

THE U. S. P. EFFERVESCENT SALTS.

While the general principle underlying these preparations, that of furnishing the moisture of the formula from the materials in it, is a good one, we found that in every case it was necessary to make some change to give a formula that not only works well but a product that keeps well. Moreover the clause in the working directions, "by the aid of careful manipulation with a wooden spatula," should be entirely omitted. The mixture should be allowed to acquire a soft, doughy consistency without any manipulation and then rubbed through a sieve. The formulas which follow have all been tried and proved.

EFFERVESCENT CITRATED CAFFEINE.

The formula of the U. S. P. furnishes too little moisture and works badly particularly on a small quantity. To obviate this defect we decreased the amount of tartaric acid and increased the amount of citric acid which contains crystal water and also substituted crystallized sodium carbonate for part of the bicarbonate. Our formula follows:

Caffeine, Citrated	40 Gm.
Acid, Tartaric, powdered	150 Gm.
Acid, Citric (No. 24, powder)	335 Gm.
Sodium Bicarb.	510 Gm.
Sodium Carbonate, Cryst. (No. 24, powder)	100 Gm.

To make about 1000 Gm

EFFERVESCENT MAGNESIUM SULPHATE.

When the magnesium sulphate is dried till it ceases to lose weight it does not make a clear solution in the effervescent mixture, moreover when tartaric acid is used the solution of this effervescent salt is not clear.

When one proceeds as follows a nice preparation results, completely and readily soluble:

Magnesium Sulphate, No. 24 Granule	500 Gm.
Dry at moderate heat till it weighs	419 Gm.
Then add Citric Acid fresh powder from uneffloresced crystals	365 Gm.
Sodium Bicarb.	428 Gm.

To make about 1000 Gm.

EFFERVESCENT LITHIUM CITRATE.

In this case also the formula of the U. S. P. furnishes too little moisture and works badly, particularly on a small quantity. We found it necessary to decrease the amount of tartaric acid and increase the amount of citric acid which contains crystal water and also to substitute crystallized sodium carbonate for part of the bicarbonate. Our formula follows:

Lithium Citrate (No. 24, powder)	50 Gm.
Sodium Bicarb.	575 Gm.
Sodium Carbonate, Cryst. (Powder to No. 24)	50 Gm.
Acid, Tartaric, powdered	175 Gm.
Acid, Citric, uneffloresced crystals (Powder to No. 24)	341 Gm.

To make about 1000 Gm.

EFFERVESCENT POTASSIUM CITRATE.

The U. S. P. formula gives a product which does not keep. We found it necessary to keep out the tartaric acid entirely and use a small amount of sugar to give a little hardness to the granule. It is not necessary to dry the potassium citrate first as the U. S. P. states. Our formula follows:

Potassium Citrate, No. 24 Granule	200 Gm.
Sodium Bicarb.	560 Gm.
Sugar	75 Gm.
Acid, Citric, uneffloresced crystals (Powder to No. 24)	500 Gm.

To make about 1000 Gm.

EFFERVESCENT SODIUM PHOSPHATE.

We replaced some of the exsiccated sodium phosphate with granulated sodium phosphate to supply additional water, also slightly increased the total acid to give a finished product which would taste faintly acid and not so flat as that which is obtained by using the U. S. P. formula. Our formula follows:

Sodium Phosphate, No. 24 Granule.	100 Gm.
Sodium Phosphate, Exsic.	160 Gm.
Sodium Bicarb.	480 Gm.
Acid, Tartaric, powdered.	255 Gm.
Acid, Citric, uneffloresced crystals (Powder to No. 24)	180 Gm.

To make about 1000 Gm.

EXTRACT OF COLCHICUM CORM.

We use 10 per cent. acetic acid instead of 6 per cent. acetic acid for the extraction of the drug, for the reason that less menstruum is required and the resultant product, while identical therapeutically, makes a smoother and nicer extract.

FLUIDEXTRACTS.

The question of alcoholic strength in the menstruums of our various medicaments is an old one. Those of us who can go back forty or fifty years know what an important part it has played in the perfection of medicinal preparations. A menstruum must be chosen which will dissolve all the active principles of the drug in the quantity of liquid that can be used, but where there is a choice between menstruums of different strengths, the weaker one should be chosen.

FLUIDEXTRACT OF ACONITE ROOT.

We think the Committee of Revision took a step in the right direction when it reduced the alcoholic strength of the menstruum for this preparation from 91 per cent. alcohol to 70 per cent. alcohol, and we think it would have been still better had they gone further and made it 41 per cent. alcohol. This latter degree of strength exhausts the drug completely and gives a fluidextract that not only fully represents the drug, but has this advantage as well, it mixes with water and other simple diluents much better than the more strongly alcoholic one, a very desirable thing with so potent a remedy.

FLUIDEXTRACT OF CIMICIFUGA.

We find a menstruum of 60 per cent. alcohol exhausts the drug completely when the repercolation process is used, and have therefore not changed to the 92.3 per cent. alcohol adopted by the last edition of the U. S. P.

FLUIDEXTRACT OF DANDELION.

We are not able to adopt the U. S. P., 1900, formula for this preparation because experiments showed that soon after the addition of the caustic soda the solution became cloudy and soon began to deposit. After a comparatively short time a voluminous deposit had formed which settled very slowly. We were therefore obliged to continue with the formula of the U. S. P., 1890, using the cold repercolation process. We think it decidedly better to leave the addition of the solution of sodium hydroxide, when needed, to the pharmacist.

FLUIDEXTRACT OF LICORICE ROOT.

The process given in the U. S. P., 1890, is a good one. It is in accord with the general method for making U. S. P. fluidextracts and gives a good product. The process of the U. S. P., 1900, is cumbersome and somewhat troublesome, and after all does not yield a product which has any advantage over the 1890 preparation.

GLYCERITE OF BOROGLYCERIN.

The U. S. P. gives a preparation that is apt to discolor during the process of making. By increasing the boric acid we get a whiter preparation:

Boric Acid, Granular	350 Gm.
Glycerin, q. s. to make 1000 Gm.	

Follow U. S. P. directions.

SOLUBLE FERRIC PHOSPHATE.

When the 1890 U. S. P. was official it was impossible to make a green salt with the formula given. We preferred to follow the formula and get the salt that the formula gave rather than the green salt described.

When the eighth revision came out, no formula was given, but a green salt was described so we had no choice but to make the green salt and a formula which will yield such a salt is here given:

Solution Iron Tersulphate	135	Gm.
Caustic Soda, U. S. P.	50	Gm.
Citric Acid	53½	Gm.
Sodium Phosphate	76	Gm.
Water, sufficient,		
To make about 100 Gm.		

Directions.

Dilute the iron tersulphate solution with 300 Cc. of water. Dissolve the caustic soda in 300 Cc. of water in a container which holds about 2000 Cc. Pour the diluted tersulphate of iron solution into the diluted caustic soda solution rapidly and with constant stirring, then fill the container with water while stirring. When settled decant and wash three times. Drain the magma of most of its water. Dissolve the citric acid and the sodium phosphate together in just sufficient cold water, feed into this gradually the iron magma, let stand for about 24 hours and warm it to about 60° C. (140° F.), and when the solution is complete, filter. Concentrate the filtrate over a water bath at a temperature not exceeding 60° C. (140° F.) to a syrupy consistency and spread on plates so that when dried the salt may be obtained in scales without heat.

BENZOATED LARD.

We obtain better results by dissolving the benzoin in just sufficient alcohol and pouring this solution into the melted lard, then completing the preparation as directed by the U. S. P.

OINTMENTS OF THE U. S. P.

Anhydrous wool fat is of great service in the preparation of ointments made with chemicals which dry hard and gritty. It affords an opportunity to use freshly-precipitated magmas drained as thoroughly as possible. For example—in the case of the U. S. P. formula for ammoniated mercury ointment it would be possible to leave 12 grammes of water in the magma by using 28 grammes anhydrous wool fat instead of 40 grammes hydrous wool fat and still finish up with a strictly U. S. P. ointment absolutely free from grit. This also applies to ointments such as ointment of iodide of potash where water is necessary to dissolve a chemical in the formula.

OLEORESINS.

We continue to use ether in the preparation of the oleoresins, as experiments have proven that it gives a much smoother and nicer oleoresin. In our hands the product yielded from male fern by U. S. P. acetone contained so much undesirable extractive that we found it necessary to purify it by dissolving in ether. There is no more trouble in handling ether than there is in handling the official acetone, and now that the cost of ether has fallen to about one-third what it was at the time of its abandonment in favor of acetone, it may be worth while to consider whether the U. S. P. should not go back again to the use of ether.

SOFT SOAP.

During the progress of the eighth revision of the U. S. P. we advocated the use of cottonseed oil instead of linseed. We have had no reason to change our views and still think it would be more desirable in every way, especially as to the keeping qualities. Working with cottonseed oil we find it is not necessary to use alcohol to hasten the saponification if in its place a little soap is used previously dissolved in twice its weight of water. This will aid saponification even more than the alcohol. About 50 grammes of soap is sufficient for 400 grammes of oil.

SOLUTION IRON CHLORIDE.

We find the U. S. P., 1900, test for oxychloride of iron not safe to follow. When the loss of acid which occurs in the manufacture of this preparation is made up so that the solution stands this test it will not make a tincture without precipitating a basic chloride of iron. We, therefore, continue to make up this loss of acid to the point when the solution stands the U. S. P., 1890, test for oxychloride.

SIMPLE SYRUP.

The best sugar to use for this purpose is what is known in the market as "Crystal A" Confectioner's Sugar. This fact has been mentioned by many different people but still does not seem to be taken advantage of by the pharmacists generally. The importance of it is shown up very clearly in such syrups as syrup iodide of iron and syrup of hydriodic acid which keep a much better color when this sugar is used. We believe some statement explaining the difference between the ordinary granulated sugar and the above-mentioned variety would be of advantage to the pharmacist.

SYRUP OF FERROUS IODIDE, U. S. P.

The diluted hypophosphorous acid used in this formula to preserve the green color has been found unsatisfactory in our experience. The use of one-quarter of 1 per cent. of citric acid instead of the diluted hypophosphorous acid has proved very satisfactory. The sugar used in this as in all syrups should be what is known as Confectioner's "Crystal A Sugar."

TINCTURE OF FERRIC CHLORIDE.

The 1860 formula by which the solution of iron chloride is made with an excess of nitric acid, gives a product containing more volatile ethers, consequently more aromatic and agreeable to the patient. By the following slight modification of the U. S. P. formula it is possible to practically duplicate the 1860 product:

Solution Ferric Chloride, U. S. P.	350 Cc.
Acid, Nitric, U. S. P.	0.5 Cc.
Alcohol, q. s. to make 1000 Cc.	

Warm the solution iron chloride to about 40° C., add the nitric acid and then the alcohol. Mix thoroughly, etc.

TINCTURE OF DEODORIZED OPIUM.

We continue to use ether (in accordance with the U. S. P., 1890, process) in preference to the purified petroleum benzin of the U. S. P., 1900. Our reason for this preference is based on the difficulty we have experienced in preparing a purified benzin sufficiently free from substances which leave an odor in the finished tincture.

TINCTURE OF STROPHANTHUS.

We advise the separation of the oil by cooling down to 25° F. and then filtering.

MERCURIAL OINTMENT.

While the addition of oleate of mercury may be a necessity in extinguishing the mercury on a small scale, on a manufacturing

scale it is neither necessary nor desirable as it gives a greenish-blue color to the ointment when exposed to the air. There seems to be rather too much lard in the U. S. P. formula for warm weather, the ointment getting too soft. Use:

Mercury	500 Gm.
Benzoinated Lard	150 Gm.
Prepared Suet	350 Gm.

Follow U. S. P. direction for work.

U. S. PHARMACOPOEIA ASSAYS.

In our experience we found it necessary in some cases to make modifications to insure uniform and accurate results. In other cases the change was made only to prevent emulsification and thus save considerable time in carrying out the process.

ACID SULPHUROUS ASSAY.

The U. S. P., 1900, method followed out exactly does not give uniform results. The results are also low. By modifying the procedure of the U. S. P. a little, satisfactory results are obtained. The modification suggested is as follows: Run the decinormal iodine volumetric solution in the flask first, weigh, then add the sulphurous acid and weigh again. The difference is the weight of the sample taken. Allow to stand for five minutes, then titrate back the excess of decinormal iodine volumetric solution with decinormal sodium thiosulphate volumetric solution.

AMMONIA WATER ASSAY.

Draw 25 Cc. normal sulphuric acid into a flask, weigh, add sample, weigh again and titrate back with normal potassium hydrate, using methyl orange as an indicator. This prevents loss during weighing.

AMMONIUM CARBONATE ASSAY.

Instead of weighing the ammonium carbonate by itself it is better to place the water in the flask first, weigh, then add the ammonium carbonate and weigh again. This gives the weight of the sample. Titrate with normal sulphuric acid volumetric solution, using methyl orange as indicator.

CHLORINATED LIME ASSAY.

Place about 25 Cc. of water in a flask and weigh accurately, add about 0.25 of a gramme of sample and weigh again. Then follow U. S. P. directions, breaking up any possible lumps with a stirring rod. This variation prevents loss of chlorine during handling.

EXTRACT OF NUX VOMICA ASSAY.

Introduce 2 grammes of extract nux vomica into a beaker and dissolve in about 10 Cc. of a mixture of equal parts of alcohol and 10 per cent. ammonia water. When dissolved transfer to a separatory funnel, rinsing out carefully, using the least possible quantity of alcohol-ammonia mixture so that the solution and washings combined require about 15 Cc. of the mixture. Shake out with 50 Cc. of ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.). Repeat twice, using 50 Cc. of the mixture each time, collecting extractive in another separatory funnel. From this point follow the U. S. P. This modification prevents emulsification and saves time.

FLUIDEXTRACT OF BELLADONNA ROOT ASSAY.

Transfer 10 Cc. to a separator, add 10 Cc. distilled water make alkaline with ammonia water, add 50 Cc. ether-Chloroform mixture (chloroform 55 Cc. and ether 45 Cc.) and shake well. Drain off ether-chloroform layer into a second separator. Repeat shaking out with two portions of 50 Cc. each ether-chloroform mixture and draw off into second separator. Then follow U. S. P. directions, shaking out with acid, etc.

FLUIDEXTRACT OF HYOSCYAMUS ASSAY.

(See fluidextract belladonna root assay.)

FLUIDEXTRACT OF NUX VOMICA ASSAY.

Transfer 10 Cc. to a separator, make alkaline with ammonia and shake out three times with 50 Cc. ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.). Combine the ether-chloroform extractions in a separatory funnel and proceed as in the U. S. P., shaking out with normal sulphuric acid volumetric solution, etc. This modification prevents emulsification and saves time.

FLUIDEXTRACT OF PILOCARPUS ASSAY.

Transfer 10 Cc. to a separatory funnel, make alkaline with ammonia water and shake out three times, using 50 Cc. ether each time. Combine ether extract in a separatory funnel and proceed as in the U. S. P., shaking out with normal sulphuric acid volumetric solution, etc. This method saves times frequently by preventing emulsification.

FLUIDEXTRACT OF SCOPOLA ASSAY.

(See fluidextract belladonna root assay.)

FLUIDEXTRACT OF STRAMONIUM ASSAY.

(See fluidextract belladonna root assay.)

POTASSIUM BITARTRATE ASSAY.

Weigh the sample carefully in a stoppered flask, add water q. s., and heat to solution. Titrate with normal potassium hydroxide volumetric solution, using phenolphthalein test solution as indicator. We find that the method by ignition and titration with standard sulphuric acid gives unsatisfactory duplicates.

TINCTURE OF BELLADONNA LEAVES ASSAY.

After evaporation of 100 Cc. to 10 Cc. and taking up with a mixture of equal parts of alcohol and ammonia water, add 50 Cc. ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.) and proceed as under fluidextract belladonna root assay.

TINCTURE OF HYOSCYAMUS ASSAY.

After evaporation of 100 Cc. to 10 Cc. and taking up with the least possible quantity of a mixture of equal parts of alcohol and ammonia water, add 50 Cc. ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.) and proceed as under fluidextract belladonna root assay.

TINCTURE OF NUX VOMICA ASSAY.

After evaporation of 100 Cc. to 10 Cc. and taking up with the least possible quantity of a mixture of equal parts of alcohol and ammonia water, add 50 Cc. of ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.) and proceed as under fluidextract nux vomica assay.

TINCTURE OF STRAMONIUM ASSAY.

After evaporation of 100 Cc. to 10 Cc. and taking up with a mixture of equal parts of alcohol and ammonia water, add 50 Cc. ether-chloroform mixture (chloroform 55 Cc. and ether 45 Cc.) and proceed as under fluidextract belladonna root assay.

We will now take up some of the formulas of the National Formulary.

BOROGLYCERIN.

The N. F. formula does not give a solid enough preparation and it is quite liable to char when brought down to the required weight. The use of granular boric acid is recommended because it works in more readily. Increasing the boric acid in the formula gives a harder and whiter preparation. Our formula is:

Boric Acid	700 Gm.
Glycerin	920 Gm.

To make 1000 Gm.

COMPOUND SALICYLATED COLLODION.

Salicylic Acid	11 parts.
Fluidextract Cannabis Indica, U. S. P.	10 parts.
Contractile Collodion, q. s. to make 100 parts.	

It is certainly easier for the pharmacist to add the fluidextract of cannabis indica than to dissolve the extract in alcohol and then add the solution, and when we consider the use to which the collodion salicylated is put, contractile collodion should be better than flexible collodion, and in our experience it is better.

ELIXIR GENTIAN.

The official formula prescribes 25 Cc. of solution of ferric sulphate, U. S. P. We have found that it is necessary to use 37½ Cc. in order to completely detannate the gentian.

ELIXIR GLYCEROPHOSPHATES.

To insure a permanent solution we find it is necessary to increase the phosphoric acid from 8 grammes to 10 grammes.

ELIXIR PARALDEHYDE.

To give a perfectly clear product we find it is necessary to increase the alcohol from 315 Cc. to 330 Cc.

ELIXIR TERPIN HYDRATE.

Elixir Terpin Hydrate with Codeine and Elixir Terpin Hydrate with Heroin.

Our experience with these three elixirs has been that in all of them some of the terpin hydrate when exposed to low temperatures crystallizes out. We have obtained satisfactory elixirs by increasing the amount of alcohol from 400 Cc. to 436 Cc. and omitting the simple syrup altogether, and making up to 1000 Cc. with glycerin. Our formula for elixir terpin hydrate is as follows:

Terpin Hydrate	17.5 Gm.
Tinct. Sweet Orange Peel	10 Cc.
Solution of Saccharin	1 Cc.
Alcohol	436 Cc.
Glycerin, q. s. to make 1000 Cc.	

GLYCERITE OF BISMUTH.

We have found that when the magma is diluted with 1000 Cc. of distilled water as prescribed by the N. F. the bismuth is not completely precipitated. In order to insure complete precipitation it is necessary to dilute with 5000 Cc. of distilled water instead of 1000 Cc.

THE GRANULAR EFFERVESCENT SALTS OF THE NATIONAL FORMULARY.

These preparations are treated in the N. F. as an addition to the effervescent powders and an attempt is there made to utilize the formula of the effervescent powders by using one-half of the saccharated citric acid instead of one-half of the saccharated tartaric acid. This has given a formula containing altogether too much sugar which results in a dough too tough to handle even in the quantity of 1000 grammes, and this objection becomes more serious in larger quantities. A formula should be given for each one of the granular effervescent salts of the N. F. which will work readily in both small and large quantities and give a finished preparation which will keep well. The formulas which we present can be worked under directions much like those for the U. S. P. granular effervescent salts. The active ingredients are the same in quantity as in the N. F. formula.

GRANULAR EFFERVESCENT ARTIFICIAL CARLSBAD SALT.

Artificial Carlsbad Salt, Powdered, N. F.	180 parts.
Sodium Bicarbonate.	500 parts.
Sugar, Powdered	50 parts.
Citric Acid, uneffloresced crystals	416 parts.
To make 1000 parts.	

Directions.

Powder the citric acid and pass through a No. 24 sieve. Mix the other ingredients of the formula thoroughly first, then mix with them the powdered citric acid. Place the mixed powders on a plate of glass or in a suitable dish in an oven heated to between 93° C. and 104° C. (199.4° F. and 219.2° F.) until the mixture has acquired a moist consistency, then rub it through a No. 6 tinned-iron sieve and dry the granules at a temperature not exceeding 54° C. (129.2° F.). Keep the product in well-stoppered bottles.

GRANULAR EFFERVESCENT ARTIFICIAL KISSINGEN SALT.

The same general directions for manufacture can be followed as given for the granular effervescent artificial Carlsbad Salt:

Artificial Kissingen Salt, Powdered, N. F.	280 parts.
Sodium Bicarbonate.	476 parts.
Citric Acid, uneffloresced crystals	400 parts.
Sugar, Powdered	25 parts.
To make 1000 parts.	

GRANULAR EFFERVESCENT POTASSIUM BROMIDE.

The same general directions for manufacture can be followed as given for the granular effervescent Carlsbad Salt. Use:

Potassium Bromide (No. 24, Powder)	110 parts.
Sodium Bicarbonate	575 parts.
Citric Acid, uneffloresced crystals	475 parts.
Sugar, Powdered	50 parts.

To make about 1000 parts.

GRANULAR EFFERVESCENT POTASSIUM BROMIDE WITH CAFFEINE.

The same general directions for manufacture can be followed as given for the granular effervescent carlsbad salt. Use:

Potassium Bromide (No. 24, Powder)	110 parts.
Sodium Bicarbonate	575 parts.
Caffeine	11 parts.
Sugar, Powdered	55 parts.
Citric Acid, uneffloresced crystals	475 parts.

To make about 1000 parts.

GRANULAR EFFERVESCENT ARTIFICIAL VICHY SALT.

The same general directions for manufacture can be followed as given for the granular effervescent carlsbad salt. The formula is:

Artificial Vichy Salt, Powdered, N. F.	240 parts.
Sodium Bicarbonate	500 parts.
Sugar, Powdered	50 parts.
Citric Acid, uneffloresced crystals	416 parts.

To make about 1000 parts.

GRANULAR EFFERVESCENT ARTIFICIAL VICHY SALT WITH LITHIUM.

The same general directions for manufacture can be followed as given for the granular effervescent carlsbad salt. The formula is:

Artificial Vichy Salt, Powdered, N. F.	156 parts.
Lithium Citrate, No. 24 Granule	56 parts.
Sodium Bicarbonate	500 parts.
Sugar, Powdered	50 parts.
Citric Acid, uneffloresced crystals	416 parts.

To make 1000 parts.

COMPOUND OINTMENT RESORCIN.

In preparing this ointment we have found it advantageous to use instead of the 35 parts of hydrous wool fat, 25 parts of anhydrous wool fat and 10 parts of distilled water. Dissolve the resorcinol in the distilled water and add this to the anhydrous wool fat previously melted. To this add gradually the zinc oxide and bismuth subnitrate previously mixed and passed through a No. 60 sieve. Triturate until perfectly smooth. Incorporate with this the paraffin and petrolatum previously melted together and lastly the oil of cade. Mix intimately and preserve the ointment in containers protected from the light. As we use the same amount of resor-

cinol, zinc oxide, bismuth subnitrate, oil of cade, paraffin and petrolatum, it will be seen that the finished product is identical in composition with the present N. F. preparation—it is, however, very much smoother and much more easily made. Oil of cade should be specified *light-colored*.

OINTMENT SULPHUR COMPOUND.

We suggest that the 30 parts of lard of the N. F. formula be replaced by the same amount of anhydrous wool fat. Our experience has been that the use of the anhydrous wool fat prevents the separation of the water contained in the soft soap and therefore makes a smooth and permanent ointment, whereas the N. F. formula has not given a satisfactory ointment in our hands. *Light colored oil of cade* should be used in its preparation.

SOLUTION OF FERRIC OXYCHLORIDE.

We have found this a difficult preparation to prepare satisfactorily. The following formula has given good results:

Solution of Iron Tersulphate	350 Gm.
Sodium Hydroxide	146 Gm.
Granulated Sugar	28 Gm.
Hydrochloric Acid	35 Gm.
Sodium Citrate	127 Gm.
Distilled Water, q. s. to make	1000 Gm.

The directions we follow are: Mix the solution of iron tersulphate with 4000 Cc. of distilled water. Dissolve the sodium hydroxide and 14 grammes of the sugar in 4000 Cc. of distilled water. Run the iron solution gradually into the sodium hydroxide solution, stirring constantly. Allow the mixture to stand until the precipitate has settled out. Then decant the supernatant liquid. While stirring add to the precipitate 4000 Cc. of distilled water in which has been dissolved 7 grammes of the sugar. Allow the precipitate to settle. Decant as before and wash the precipitate again with 4000 Cc. of distilled water in which is dissolved the remaining 7 grammes of the sugar. Allow the precipitate to settle, draw the supernatant liquid off, drain the precipitate on muslin. Express as much of the moisture as possible and slowly feed the magma into the 35 grammes of hydrochloric acid diluted with 50 Cc. of distilled water. Add the sodium citrate and when the magma has all dissolved add distilled water sufficient to make 1000 grammes. Keep in well-stoppered bottles. Whenever solution of iron oxychloride is referred to in this paper it is this particular solution that is meant. It is used in the three preparations following.

SOLUTION OF IRON ALBUMINATE.

The first requisite for making a clear solution of iron albuminate is a clear solution of iron oxychloride. Given such a solution the following formula gives a good product:

Egg Albumen, Dried	8 Gm.
Solution of Iron Oxychloride	130 Cc.
Aromatic Elixir	400 Cc.
Alcohol	120 Cc.
Distilled Water, q. s. to make 1000 Cc.	

In working this formula we proceed as follows: Dissolve the egg albumen in 180 Cc. cold distilled water, add the solution iron oxychloride, stirring constantly. When the solution is perfectly clear add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 1000 Cc. Let stand over night and filter.

SOLUTION OF IRON PEPTONATE.

As is the case with solution iron albuminate a clear solution of iron oxychloride must be used in order to get a satisfactory solution of iron peptonate. The formula which we have found satisfactory is the following:

Peptone, Dry	9.75 Gm.
Solution of Iron Oxychloride	200 Cc.
Aromatic Elixir	400 Cc.
Alcohol	120 Cc.
Distilled Water, q. s. to make 1000 Cc.	

Dissolve the peptone in 150 Cc. cold distilled water, add the solution iron oxychloride, stirring constantly. When the solution is perfectly clear add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 1000 Cc. Let stand over night and filter.

SOLUTION OF PEPTONATE OF IRON WITH MANGANESE.

A clear solution of iron oxychloride is as necessary in making this preparation as in making iron albuminate and iron peptonate. The following formula gives good results:

Peptone, Dry	3.5 Gm.
Solution of Iron Oxychloride	71.5 Cc.
Manganese Citrate, Soluble	8 Gm.
Alcohol	150 Cc.
Aromatic Elixir	50 Cc.
Distilled Water, q. s. to make 1000 Cc.	

Dissolve the peptone in 150 Cc. cold distilled water, add the solu-

tion iron oxychloride, stirring constantly. When the solution is perfectly clear add the manganese citrate dissolved in 100 Cc. distilled water, then add the aromatic elixir and alcohol previously mixed, and finally enough distilled water to make 1000 Cc. Let stand two days and filter.

COMPOUND SOLUTION OF HYPOPHOSPHITES.

The darkening which always occurs in the N. F. preparation may be overcome by using ferrous hypophosphite in place of ferric. The ferrous hypophosphite may be prepared in the following manner: Dissolve 6.5 grammes of ferrous sulphate in 50 Cc. of distilled water. To this add 1 Cc. hypophosphorous acid. Dissolve 4 grammes calcium hypophosphite in 100 Cc. distilled water. Mix these two solutions and put in a cold place surrounded by ice, if possible, for two hours. Filter through a plain filter and wash the filtrate with enough distilled water to make the filtrate measure 200 Cc. We also prefer to use 0.2 Cc. of spirit of curacao in place of the 25 Cc. of orange-flower water and to add 0.2 grammes of saccharin to each 1000 Cc. of the solution, but the question of the flavor of preparations is something we do not care to go into here.

TINCTURE OF IRON CITROCHLORIDE.

Our experience has been that when elixir iron, quinine and strychnine is prepared by the use of tincture iron citrochloride, N. F., crystallization almost invariably takes place. If however the 425 grammes of sodium citrate in the N. F. formula is replaced by 390 grammes of potassium citrate, the trouble with the elixir is overcome. We, therefore, suggest that this change be made.

The Chair invited discussion upon this very interesting and valuable paper, but none was offered, and upon motion of Mr. Asher, of New Orleans, it was received and referred to the Publication Committee.

The next paper called for was one prepared by a special committee of the Philadelphia Branch, making certain suggestions for the improvement of the National Formulary.

Mr. Wilbert, acting Secretary, gave an abstract of this paper, the full text thereof being as follows:

SUGGESTIONS FOR IMPROVEMENTS IN THE NATIONAL FORMULARY.

At the request of the Chairman of the Section on Practical Pharmacy and Dispensing of the A. Ph. A., the President of the Philadelphia Branch of the A. Ph. A. appointed the Committee signing this report, to collect and present to the annual meeting of the Association, such suggestions for the revision of the National Formulary as might be obtainable from the members of the Local Branch.

The Committee mailed a Circular to each member of the Branch, about 150 in number, requesting contributions and enclosing a blank form carrying four general questions, as follows:

"If you know of any formulas in the N. F. which are not satisfactory, name them.

"If you can suggest an improvement in any formula in the N. F., give us the details.

"What additions to the N. F. would you recommend?

"What formulas or titles in the N. F. would you recommend dismissing or changing; give your reason for so doing?"

Responses were received from sixteen members of the Branch; several communications were unsigned, but we are able to acknowledge the receipt of recommendations from the following: Messrs. F. M Apple, H. C. Blair, William L. Cliffe, E. T. Ellis, Wm. G. Greenawalt, C. A. Harbold, C. H. Kimberly, J. E. Marsden, Wm. G. Nebig, S. J. Riegel, and the members of the Committee.

The suggestions have been arranged in alphabetical order for convenience of reference.

Elixir of Anise.—One contributor thinks this elixir is too "sweet and heavy."

Elixir of Celery, Compound.—The title should indicate the presence of coca. The alcoholic strength should be reduced as it is too strong for a nerve sedative.

Elixir of Cinchona.—The title should indicate the presence of cinchona alkaloids, and the absence of cinchona bark. One contributor suggests that the color should be lighter, simple tincture of cudbear being used as a coloring.

Elixir Digestive, Compound.—Two elixirs of this type, both red, are suggested, one containing pepsin only, the other pancreatin and diastase only.

Elixir of Gentian, Glycerinated.—The formula should be improved (see recommendations made by Apple, P. P. A. Proc., 1907). Another suggests that the saccharin be eliminated as the preparation is sweet enough without it and also better adapted for the purpose for which it is generally prescribed, if saccharin is not present.

Elixir of Glycerophosphates.—W. L. Cliffe suggests the following:

Sodium glycerophosphate	25	Gm.
Calcium glycerophosphate	8.75	Gm.
Phosphoric acid, U. S. P	10	Gm.
Glycerin	240	Cc.
Angelica wine	300	Cc.
Alcohol	30	Cc.
Tincture of sweet orange peel	10	Cc.
Distilled water, a sufficient quantity, to make	100	Cc.

The present directions are satisfactory but the additional phosphoric acid is required by the glycerophosphates on the market. This preparation is smoother and more palatable than the one made from aromatic elixir.

Elixir of Glycyrrhiza.—This elixir should be dismissed, it is practically a duplicate of the U. S. P. adjuvant elixir.

Elixir of Pepsin.—As the essence of pepsin is a far more satisfactory preparation, this should be dismissed.

Elixir of Potassium Bromide.—This and other elixirs containing bromides should be of a weaker alcoholic strength.

Elixir of Terpin Hydrate.—The following formula has been used for years and has given entire satisfaction, writes one contributor:

Terpin hydrate	384 grains.
Spirit of bitter almond	30 min.
Comp. spirit of orange	45 min.
Glycerin	1 fl. oz.
Water	3 fl. ozs.
Syrup of wild cherry	6 fl. ozs.
Alcohol, sufficient to make	3 pints.

No directions were given.

Emulsion of Cod Liver Oil, Glyconin.—This emulsion is not satisfactory.

Emulsion of Petroleum.—Very unsatisfactory. The emulsion separates quickly. It should contain calcium and sodium hypophosphites.

Essence of Pepsin.—Mr. C. A. Harbold writes: "It contains too much syrup. The rennin should be standardized and the wine should first be clarified by the addition of 100 Cc. of milk to each 1000 Cc. of wine, allowing it to stand about an hour and filtering. The essence made from this wine is clearer and keeps better." Another contributor suggests that if alcohol and water be used in the proper proportions, replacing the wine, and then suitable flavor be added, that the preparation will be far more uniform. Yet another contributor says that it is really a compound essence and the present title is misrepresentative; also that the formula does not give entire satisfaction.

Glycerite of Pepsin.—The addition of 4 fl. ozs. of imported stronger orange flower water to each gallon of glycerite greatly improves the flavor and destroys the unpleasant taste of the pepsin.

Mixture of Soda and Spearmint.—One writer strongly urges that the use of peppermint water be restored in place of the present spearmint water. Another suggestion is, that instead of using spearmint water, why not order 2 Cc. of oil of spearmint and 15 Gm. of purified talc in the present formula and modify the directions accordingly.

Solution of Albuminate of Iron.—Gelatinization occurs within a short time.

Solution, Alkaline Antiseptic.—It is suggested that the preparation is improved by using 16 Gm. of sodium bicarbonate in place of the 32 Gm. of potassium bicarbonate; also to reduce the sodium benzoate to 8 Gm. and the glycerin to 125 Cc. per 1000 Cc. For coloring, ground cudbear should be used. Another contributor suggests that in place of ordering the small quantities of oils and aromatics a stock, alcoholic solution should be made and the necessary quantity of this directed in the formula. This would overcome much of the variation in odor and taste.

Solution of Hypophosphites, Compound.—The solution develops mould growths very quickly; this should be overcome in some way. Another contributor says: "This preparation will not keep indefinitely, as it is peculiarly liable to vegetable growths of a ropy, mucus-like character. A long experience with a similar preparation has shown that the addition of 10 per cent. of alcohol is the best preservative, yielding, with the present formula, a preparation that is entirely permanent and satisfactory."

Solution of Peptonate of Iron with Manganese.—W. G. Nebig suggests Harrison's formula.

Solution of Albuminate of Iron.—W. G. Nebig also suggests the following, and says that both formulas give entire satisfaction:

Dry egg-albumen	40 Gm.	
Solution of ferric chloride	45.5 Gm.	(U. S. P.)
Ammonia water, 10 per cent.	34.5 Gm.	
Sodium citrate	25 Gm.	
Aromatic elixir	400 Cc.	
Distilled water, a sufficient quantity to make	1000 Cc.	

Dissolve the egg albumen in 2000 Cc. of distilled water, digest the mixture at 40° C. until the solution gives no precipitate on boiling. Dilute the ammonia water with an equal volume of water and add it slowly and in small portions to the solution of ferric chloride, shaking after each addition until the precipitate which first forms has redissolved. When all of the ammonia water has been added, dilute the solution with 2000 Cc. of water and add the albumin solution to the iron solution, slowly with constant stirring. Precipitate this solution with a diluted solution of sodium hydroxide, carefully added, until the liquid is neutral. Allow the precipitate to settle and wash it with distilled water until the washings give only a faint opalescence with silver nitrate.

Drain the precipitate on a muslin strainer, transfer it to a porcelain dish, add the sodium citrate, previously dissolved in 50 Cc. of distilled water, and gently heat until the magma is dissolved. Cool the solution, add the aromatic elixir and, lastly, enough water distilled to measure 1000 Cc.

Solution of Peptonate of Iron with Manganese.—Wm. L. Cliffe says: "This preparation should be prepared in the same manner as the solution of peptonate of iron from a suitable solution of manganese and ferric chloride. In following this process a caution should be inserted in regard to the preservation of the precipitated magma when operating in warm weather. Subsidence and decantation with weak chloroform water has proved satisfactory with us. In place of the preliminary peptonizing of egg albumin, as has been suggested, a prepared dry peptone can be ordered. This is on the market of excellent quality and low price."

Solution of Sodium Carbolate.—The title should conform to the U. S. P. nomenclature, "Phenolate" in place of "Carbolate."

Syrup of Eriodictyon, Aromatic.—It would be better if the strong alkalinity of this syrup would be indicated in the title.

Syrup, Pectoral.—If retained, this preparation should be made as originally suggested by Dr. Samuel Jackson, or else the synonym should be dropped. It is a dangerous preparation for general sale, owing to the presence of morphine.

Syrup of the Phosphates, Compound, with Quinine and Strychnine.—Mr. Wm. L. Cliffe says that the formula and process give very unsatisfactory results. The strychnine and quinine should be dissolved in the mixed solution of the iron and other salts; the sugar should be reduced to 425 Gm. and the 50 Cc. of glycerin dropped.

Syrup of Phosphates, Compound.—The present formula produces more than the 1000 Cc. without the addition of water, says one contributor. Omit the 75 Cc. of glycerin and, with that exception, permit the formula to remain as at present.

Syrup of Rhamnus Catharticus.—The formula for the syrup of buckthorn should direct its preparation from the fluidextract.

Tincture of Cudbear.—Prepare by maceration.

Wine, Angelica.—When this wine is ordered it should have a definite alcoholic strength, preferably 18 to 20 per cent. Most of the trouble with the formula for essence of pepsin can be traced to the use of a wine deficient in alcohol.

Wine of Beef and Wine of Beef and Iron.—It is impracticable for a retail pharmacist to distil off the alcohol, and the formula of the N. F. is therefore prohibitorily expensive. There should be a more economical process.

As the following can readily be prepared extemporaneously if wanted, their dismissal from the N. F. is suggested:

Elixir of buchu and potassium acetate.
Elixir of potassium acetate.
Elixir of sodium salicylate.

The following additions are suggested:

Cream of Camphor.—A formula for this preparation should be introduced into the N. F. The following is suggested; it conforms in strength and ingredients with the formulas most generally used:

Castile Soap	120 grains.
Ammonium carbonate, clear pieces	120 grains.
Powdered camphor	120 grains.
Oil of thyme	1 fl. dram.
Oil of turpentine	2 fl. ozs.
Tincture of opium	2 fl. drams.
Water, a sufficient quantity to make	1 pint.

Dissolve the soap and the ammonium carbonate in 10 fl. ozs. of water and introduce the solution into a pint bottle. Dissolve the camphor in the mixed oils and add this to the soap solution, shaking the bottle vigorously until an emulsion is formed. Finally add the tincture of opium and water to make one pint.

Elixir of Glycerophosphates, Compound.—Should be introduced.

Elixir of Papaw (Carica Papaya).—Should be introduced.

Extract of Papaw (Carica Papaya).—Should be introduced.

Solution of Glycerophosphates, Compound.—Should be introduced.

E. Fullerton Cook, *Chairman*,
Richard H. Lackoy,
Frank S. McCartney.

Upon motion of Mr. Wilbert, seconded by Mr. Binz, the paper was ordered to take the usual course, and be printed in the Proceedings.

The Chair stated that a paper by Mr. Bruder, of Chicago, on the same subject as the paper just presented by the Special Committee would, without objection, be received and referred to take the usual course, and it was so ordered.

SUGGESTIONS FOR THE IMPROVEMENT OF THE NATIONAL FORMULARY.

BY OTTO E. BRUDER.

When one considers the great power that the National Formulary has been to foster active propaganda work between the physician and the pharmacist, it is small wonder that fault is found with various formulas in this work.

When fifteen or twenty thousand retail druggists, operating widely apart, in cold and warm climates, are engaged in making the same preparation, it is to be expected that any possible faults in that preparation will be discovered.

Nothing human is perfect, and our efforts should be in the direction of making things as near perfect as possible. The present third edition of the National Formula is a great improvement over the second and first editions, and while the fourth edition will not be perfect, the following few suggestions may be of assistance:

GENERAL SUGGESTIONS.

In the first place the great majority of such preparations as are directed to contain fluidextracts, should be made from the drug itself by percolation. Pharmacists generally have these drugs, but the fluidextracts are seldom, if ever, used or called for, except in these preparations, and the benefits derived, if any, do not warrant either the making or the purchasing of these fluidextracts. Besides, if these preparations were made from the drugs they would be more representative pharmaceutically, and generally also more effective therapeutically.

A few of the preparations to be gainers by this process are the com-

pound elixir of buchu, the compound elixir of celery, the compound cathartic elixir, the compound elixir of corydalis, the vinous tincture of rhubarb, and others.

This would be in harmony with real scientific laboratory work, in which the pharmacists of to-day are becoming actively interested and it also is the process employed in making such very reliable preparations as blackberry cordial, compound tincture of viburnum, bitter tincture, aromatic tincture, compound wine of orange, etc.

Some mention having been made that only the metric system be used, I would suggest that no such radical action be taken.

The present arrangement suits the great majority of the pharmacists of this country, and it was a wise precaution that the third edition gave both the metric and the apothecaries' system.

It is the retail pharmacists who use the book the most and they have used the apothecaries' system for years (in some cases for over forty years), therefore, we should hesitate to make this change.

It would result in the loss of much popularity which the book now enjoys, and this we cannot afford to do, even at the expense of offending some well-meaning and scientific workers. We are yet confronting the fact that the present generation uses the apothecaries' system and are not ready for the complete overthrow of it.

We should remember that it is not what we would like to have, but what we must have now, and the pharmacist of to-day must have both systems, especially the apothecaries'.

The formulas should run alphabetically from cover to cover, thereby doing away with an appendix or parts 1 and 2. The book should be made as handy and convenient as possible, and if the retail pharmacist is considered as he should be, this is the only course advisable.

PRESERVATION INFORMATION IMPORTANT.

Again, too little attention is paid in this authoritative work to the preservation of preparations, and while most pharmacists should know how to store a preparation to keep it up to standard composition it should be the privilege of the book to contain this information.

Most preparations containing quinine and iron salts have their efficiency impaired by the action of light, and these should be directed to be stored in amber-colored bottles. Some preparations of which the pancreatic solution is a type, should be directed to be made fresh, as their activity is seriously impaired by age.

Syrups should be directed to be stored in a cool place and in small bottles, thereby preventing deterioration, and the bottles should be closed with rubber stoppers, as this is conducive to cleanliness and the ever-present danger of the ordinary cork becoming cemented in the neck of the bottle is removed.

DESIRABLE ADDITIONS.

Several desirable additions could be made to the book with proper tests for purity; for instance, Jamaica rum; this liquor is directed to be used in the phosphatic emulsion and some recognition should be taken of it, similar to that of whiskey, brandy and the natural wines of the Pharmacopœia.

Angelica wine, which is directed to be used in the preparation of essence of pepsin, should be treated in the same manner. Also molasses is directed in the mixture of sassafras and opium, and for want of a standard article many different-looking mixtures result when made at various times which is not consistent with good pharmacy.

Again, caramel is directed to be used in the preparation of the compound tincture of cudbear, and it is of sufficient importance to be recognized, that a uniform article may be purchasable.

Three other preparations in great demand are the spiritus ammoniæ anisatus, compound elixir of saw palmetto and the fluidextract of cactus grandiflorus, and these should find a place in the book.

In view of the fact that physicians are often called upon to prescribe preparations for the alleviation of the pain and roughness of the skin, commonly called "chapped skin," it seems that some toilet preparation could be included in the book of sufficient merit to appeal to the physician, as a compound mixture of quince seed.

This can also be said of a reliable preparation for the cure of dandruff and falling of the hair, at least as reliable as it can possibly be made, for instance, a compound tincture of jaborandi. Physicians would be pleased with two such formulæ and would feel grateful for their insertion in our official authority.

Another very important addition to the National Formulary, which however is more likely to be made to the Pharmacopœia, is the addition of a chapter on the Detection of Adulterations in Powdered Drugs by means of the Microscope; and a chapter on the important subjects of Bacteriology and Sterilization.

REMOVALS.

Several specific instances might be mentioned where formulæ could be removed from the book with profit; for instance, the stronger compound infusion of gentian; this is no more an infusion than is the compound tincture of gentian of the Pharmacopœia, and of which it is practically a duplicate.

The compound digestive elixir contains two ingredients, pepsin and pancreatin, therapeutically incompatible, and either the formula should be discontinued or the pancreatin should be left out.

The number of elixirs, some eighty-eight, also seems abnormally large and many of the simple ones could readily be dispensed with, as they offer no particular advantage to the physician.

CHANGES IN FORMULÆ.

Changes that suggest themselves for the improvement of some formulæ are the following:

Milk of magnesia; the amount of sodium hydroxide can be increased by half and the two primary solutions reduced to one-eighth of what the formula calls for; this would give a heavier precipitate and one that occupies less space, and the finished preparation can more easily be poured from one bottle to another, something hardly possible with the official preparation. This suggestion was made by a member of the Chicago Branch, A. Ph. A., Mr. Boehm, and it is a valuable one for consideration.

Solution of peptonate of iron and manganese could be greatly improved and made fairly perfect by following the modification suggested by Prof. Harrison and Thos. D. McElhenie and as stated in full in N. A. R. D. Notes of January 7th and February 18, 1909.

Elixir of terpin hydrate could be improved by leaving out the syrup which answers no useful purpose and is generally the cause of the precipitate noticed in this preparation. The syrup could well be replaced by an equal amount of glycerin. If no change is made in the formula it should at least be directed to be kept in a warm place. The official elixir with codeine could profitably be colored with caramel and the one containing heroin with cudbear or cochineal.

The alkaline antiseptic could be greatly improved in appearance and made more uniform by different operations in this respect, if the tincture of cudbear were replaced by an equivalent amount of powdered cudbear. This should be done for the reason that the tincture being a 33⅓ per cent. alcoholic preparation, loses some of its coloring properties when mixed with the much weaker alcoholic preparation into which it enters and which contains only 6 per cent. alcohol, and besides it is difficult to extract cudbear successfully to a 12½ per cent. tincture.

In the phosphatic emulsion a change could be made in the working directions which would tend to make a more stable emulsion and be more in harmony with good pharmacy. Instead of adding the phosphoric acid and the strongly alcoholic rum to a concentrated emulsion of codliver oil, the greater part of the orange-flower water should be added first and then the other ingredients.

CHANGES IN NAMES.

The name compound elixir of celery should be changed to compound elixir of kola, because it is more brief in the Latin title, confusion with opium is avoided and the new name is just as definite and representative.

The name compound elixir of cramp bark should be changed to compound elixir of trillium, for the reason that it is more brief, because trillium is the most important ingredient and also to avoid confusion with the compound tincture of cramp bark.

The name essence when applied to essence of pepsin is a misnomer, as an essence is a perfume or a modification of a perfume, either simple or compound, hence we can have no essence of pepsin, correctly speaking, and the title could be changed to compound elixir of pepsin.

The title Stokes' expectorant should be changed to compound mixture of senega, on the principle that therapeutic phrases and names of persons should find no place in the title of an official preparation.

Similar changes should be made in the names of diarrhœa mixtures, catarrh powder, compound cathartic elixir, pectoral syrup, etc.

The name "Unguentum resorcini compositum" should be changed to "Unguentum resorcinolis compositum" to correspond with the change in name from resorcinum to resorcinol; a paragraph should also be inserted in connection with this ointment to the effect that "a slight unimportant change in the color of this ointment will occur in the course of time."

PROPAGANDA WORK BENEFITED.

The National Formulary is an important factor in bringing about an effective educational propaganda campaign that will be of the greatest value to pharmacists and physicians, hence it should be the duty of every pharmacist to do what he can to improve the formulæ in this book.

Let pharmacists and physicians keep up this original work of advancing with the times, as they have so successfully done in the past ninety years, devising their own formulas and improving upon them. Then the assertion made at times by proprietors of nostrums that the National Formulary preparations are imitations will fall where they should, on barren ground—then both professions, medicine and pharmacy, will be on the right road in getting back to first principles in medicine.

The next paper on the program was one on National Formulary Preparations, by Mr. Hartz, of College Point, New York, and Mr. Wilbert presented the paper in abstract. The following is the text of the paper:

LABORATORY NOTES OF SOME N. F. AND OTHER PREPARATIONS.

BY J. D. AUG. HARTZ, COLLEGE POINT, N. Y.

At the suggestion of Mr. Raubenheimer, Associate of the Section on Practical Pharmacy and Dispensing, I beg to submit the following notes, which I hope may prove helpful to the National Formulary Committee:

SYRUP OF RASPBERRIES.

I would suggest the following process of manufacture in place of that given on page 231 of the N. F.

Take of Fresh ripe raspberries ..... any convenient quantity.
Coarse granulated sugar ..... a sufficient quantity.
Solution of Russian isinglass ..... a sufficient quantity.

Crush the berries and ferment in a glass jar covered with thin muslin for

four days at a temperature of about 70° F., express the juice, and add to every gallon of juice 1½ fluidrachms of solution of isinglass and filter. To every 10 parts by weight of the perfectly clear juice, add 18 parts of coarse granulated sugar, raise to the boiling point in a clean brass or copper kettle over a lively fire and strain through flannel. Bottle when cold.

My reasons for the suggested modifications are:

1. The proportion of 15 parts of sugar to 10 parts of juice given in the N. F. seems inadequate; I have made fruit syrups for very many years, and have never found a syrup made with the proportion of sugar above suggested to crystallize, while the keeping quality is certainly enhanced. I am now using raspberry syrup made in 1901, which is perfectly clear and and of good flavor. The only other improvement I could suggest would be the addition of 2 grains of salicylic acid to every pint of syrup, not to prevent fermentation, but to preserve the color and flavor, but, of course, such addition is out of the question under existing circumstances.

2. The N. F. directs that the pulp shall be allowed to stand until a small portion of the filtered juice mixes clear with half its volume of alcohol. The intention of this is evidently to generate sufficient alcohol by fermentation to precipitate all pectin. Both color and flavor are apt to suffer by this proceeding. The solution of isinglass suggested will precipitate all pectin held in solution after 4 days' standing, will expedite the operation of filtering and will produce an absolutely clear filtrate.

3. Coarse granulated sugar is suggested because this commercial quality contains probably 99.8 per cent. of pure saccharose; the ordinary quality of granulated sugar may be good enough for sweetening coffee, but not for any pharmaceutical product. The Pharmacopœia specifications for saccharum are not such as would exclude sugar containing albuminates, and these are causing the mischief in ordinary granulated sugar, while entirely absent in the coarse granulated sugar. I realize that this fact cannot be brought home to the pharmacists of this country, but they should know it nevertheless, for it affects the keeping qualities of a large number of preparations in 40,000 drug stores in the United States.

It might be be well to state in a footnote that syrup of mulberries and syrup of black cherries may be made in the same way as the above.

Where an aluminum vessel is accessible it is to be preferred to any other metal for boiling fruit syrups.

The solution of isinglass suggested above may be made by soaking 6 drachms of Russian isinglass in water, then shredding it and dissolving in a mixture of 4 fluidounces each of alcohol and water with aid of a gentle heat.

SOLUBLE FLUIDEXTRACT OF GRINDELIA.

Such a preparation has been placed on the market evidently made with the addition of sodium or potassium hydroxide. We have made a satisfactory preparation by the following formula:

Take of fluidextract of grindelia ..... 8 fluidounces.
Evaporate to 4 fluidounces and add monohydrated sodium carbonate 2 drachms, dissolved in water sufficient to make a total volume of the mixture 8 fluidounces.

Incorporate 15 grains of infusioral earth, transfer to a bottle and after 24 hours filter.

UNGUENTUM RESORCINI COMP.

The formula of the N. F. for this ointment has proved unsatisfactory in our hands. We find the following formula satisfactory and at the same time as keeping essentially within the N. F. proportions and ingredients:

Take of Resorcinol	6 parts.
Zinc oxide	6 parts.
Bismuth subnitrate	6 parts.
Oil of cade	12 parts.
Paraffin	10 parts.
Petrolatum	25 parts.
Anhydrous woolfat	27 parts.
Water	8 parts.

Dissolve the resorcinol in the water; rub the zinc oxide and bismuth subnitrate into a smooth paste with the petrolatum, to which add the paraffin and anhydrous woolfat previously melted together; incorporate the resorcinol solution and stir until the water globules have almost disappeared, then add the oil of cade and stir until almost cold.

We have found that compound resorcin ointment of full strength is altogether too irritating for old ulcers and have had to prepare ointments designated as 50 per cent., 25 per cent., and even 12½ per cent., these percentages indicating the reduced quantities of resorcinol and oil of cade, all other ingredients remaining the same excepting such increase in woolfat and petrolatum as was needed to bring the total up to full 100 parts. Physicians are very apt to prescribe galenicals of full strength and may be this should be taken into consideration when revising the formula of the compound resorcin ointment. Birch tar (oleum rusci) 2 Gm. substituted for oil of cade 12 Gm. in the N. F. formula for compound resorcin ointment would almost duplicate a well-advertised nostrum.

Remington's suggestion to substitute yellow wax for paraffin seems to be good for more reasons than one and should be seriously considered by the committee on revision of the National Formulary.

ELIXIR DIGESTIVUM COMPOSITUM.

We made this elixir before the second edition of the N. F. published a formula. It contains about 2 Cc. of lactic acid in a liter and sugar of milk in place of glycerin. The elixir is very efficacious and palatable and we should be pleased to submit the formula. We can not understand why

the 3rd edition of the N. F. decreased the quantity of lactic acid to ⅙ of the quantity directed in the second edition.

PETROLATUM BENZOINATUM LIQUIDUM.

Take of benzoin in very fine powder ..... 2 Gm.
Liquid petrolatum (white) ..... 1000 Gm.

Macerate for two weeks, shaking the mixture once or twice a day; then filter.

CUPRUM ALUMINATUM. (Ph. Germ. et Ph. Helv.)

Take of Potassium alum ..... 340 parts.
Copper sulphate ..... 320 parts.
Potassium nitrate ..... 320 parts.
Camphor ..... 20 parts.

Reduce the copper sulphate, potassium nitrate and 320 parts of potassium alum to No. 20 powder, heat in a shallow aluminum vessel over a slow flame to fusion, stirring with an aluminum spatula; remove from the fire and stir in the camphor and the balance of potassium alum, previously rubbed together to powder, then pour on the marble slab to cool.

MASSA PHOSPHORI.

Take of Oil of theobroma
Yellow wax of each ..... 15 Gm.
Melt and strain into a dry test-tube 24.75 Gm. of the liquid mixture and add phosphorus, well dried, 0.25 Gm.

Fit the test-tube with a good stopper and shake until the phosphorus is dissolved, occasionally reheating if necessary; transfer to a suitable glass tube fitted at the lower end with a cork, by means of which the solidified mass can be pushed upwards by means of a stick. Cork the upper orifice and keep in a dark and cool place.

This mass has been found serviceable in incorporating small quantities of phosphorus into pill masses.

SACCHARINUM SOLUBILE.

Take of Saccharin ..... 500 Gm.
Ammonia water ..... 430 Cc.

Warm in a flask until solution is effected; filter through a pledget of cotton and evaporate on shallow plates until dry. The product will weigh about 540 Gm. and is of a purer sweet taste than sodium-saccharin.

TINCTURA DELPHINII CONSOLIDÆ.

Take of Larkspur seed ..... 4 troyounces.
Acetic acid ..... 3 fluidounces.
Water ..... 21 fluidounces.
Alcohol ..... 8 fluidounces.

Macerate the larkspur seed in a mixture of the acetic acid and water for 3 days, add the alcohol and macerate again for 2 weeks, shaking once a day; then strain and filter.

TINCTURA VIBURNI OPULI COMPOSITA.

For the benefit of the N. F. committee we beg to call attention to the fact that we have collected dioscorea in this neighborhood and have dispensed a tincture made therefrom with the consent of the physicians in place of a semi-secret proprietary article seemingly to the satisfaction of both practitioner and patient.

A paper by Thomas D. McElhenie, of Brooklyn, on suggestions for the National Formulary, was received and referred to take the usual course:

SUGGESTIONS FOR NATIONAL FORMULARY.

BY THOS. D. MCELHENIE.

1. For Tinct. Antiperiodica use Quinine Hydrochloride instead of Sulphate, because of greater solubility and a slightly larger alkaloidal content, being 81.7 per cent. in the chlorine salt as against 74.3 per cent. in the sulphate.

2. Drop Extractum Glycyrrhizæ Depuratum from the Formulary, and use Extractum Glycyrrhizæ Purum, U. S. P., in making Mist. Olei Picis, N. F., etc. The two forms of extract are practically the same thing.

3. Make Glycerite of Pepsin, 100 grams to 1000 Cc. Use Scale Pepsin. Make the aqueous acidulous solution to 200 Cc., and add glycerin, 800 Cc. Omit talc and filtration.

Brooklyn, N. Y., July 1, 1909.

A paper by Mr. A. Alton Wheeler, of Detroit, containing preparations for the modification of formulas of certain N. F. preparations was next in order, and Mr. Wilbert called attention to it as one worthy of careful consideration. He presented the paper in brief abstract, the following being its text:

SUGGESTIONS FOR THE MODIFICATION OF CERTAIN NATIONAL FORMULARY PREPARATIONS.

BY A. ALTON WHEELER, DETROIT, MICH.

There are four N. F. preparations which are similar in composition and therapeutic indications; several of them not simple enough for extemporaneous preparation. They are: Compound elixir of quinine and phosphates, emulsion of cod liver oil with calcium and sodium phosphates, compound syrup of hydrochlorophosphates and compound syrup of phosphates.

For some time the writer has prepared a line of similar preparations, which are convertible extemporaneously from one to the other, and I offer

the formula for your consideration with the object in view of simplifying the present N. F. preparations a little and encouraging their use more generally. These formulas are :

COMPOUND SOLUTION OF PHOSPHATES, STRONG.

Precipitated calcium carbonate	70 Gm.
Soluble ferric phosphate	35 Gm.
Ammonium phosphate	35 Gm.
Potassium bicarbonate	8 Gm.
Sodium bicarbonate	8 Gm.
Citric acid	164 Gm.
Glycerin	375 Cc.
Phosphoric acid	140 Gm.
Orange flower water	125 Cc.
Water, a sufficient quantity, to make	1000 Cc.

COMPOUND SOLUTION OF PHOSPHATES WITHOUT SUGAR.

Strong compound solution of phosphates	500 Cc.
Water	500 Cc.

COMPOUND SYRUP OF PHOSPHATES.

Strong compound solution of phosphates	500 Cc.
Syrup	350 Cc.
Glycerin	150 Cc.

COMPOUND SYRUP OF PHOSPHATES WITH QUININE.

Quinine hydrochloride	4.4 Gm.
Compound syrup of phosphates	1000 Cc.

COMPOUND ELIXIR OF QUININE AND PHOSPHATES.

Quinine	2 Gm.
Cinchonidine	1 Gm.
Cinchonine	1 Gm.
Compound spirit of orange	12 Cc.
Tincture of cudbear	15 Cc.
Alcohol	125 Cc.
Syrup	375 Cc.
Strong compound solution of phosphates	500 Cc.

EMULSION OF CODLIVER OIL WITH PHOSPHATES.

Codliver oil	464 Gm.
Acacia	116 Gm.
Compound syrup of phosphates	250 Cc.
Flavoring, a sufficient quantity water, a sufficient quantity to make	1000 Cc.

The Association has avoided as far as possible having one formula depend on another, which policy seems to be a wise one. At first thought this objection might be made to the above-suggested changes. However attention is called to the fact that the strong compound solution of phosphates is the only preparation duplicated in the different formulas of this

series. The above objection would therefore not apply in this case any more than it would to aromatic elixir in the formulas of the various elixirs.

The convenience of the above formulas can readily be seen. The whole six preparations can be kept in stock or any one of the five can be prepared extemporaneously from the strong compound solution of phosphates as the dispenser pleases. For this reason the writer offers these suggestions and trusts that they may be of some value.

Mr. Wilbert suggested that this paper came from the establishment of Chairman Seltzer, and thought possibly he could tell the members something more along this line.

Mr. Seltzer said that this was a line of preparations that had been used in his store for a good many years, and he has had no trouble in keeping them for an ordinary length of time. He assumed that, if allowed to stand for an unreasonable length of time, it would lead to trouble.

The Chair invited further discussion, but none was offered, and the paper was ordered to take the usual course.

A paper on National Formulary elixirs, the eighth item on the program, was received and referred to take the usual course, in the absence of the author, William Mittelbach, of Missouri:

THE NATIONAL FORMULARY ELIXIRS.

BY WM. MITTELBACH, BOONVILLE, MO.

The interest manifested throughout the country relative to the elixirs is a good sign. It indicates that these nice galenicals are coming into use more and more; and the constant efforts made towards the improvement of these formulas augurs well for our profession. That there is a strong and growing sentiment in favor of eliminating from the N. F. such elixirs as are really not elixirs in the true sense of the word, portends a better condition. There are several mixtures of fluidextracts and aromatic elixir, that should not be recognized as elixirs. They should be dropped. The physician wishing such a mixture can just as well write for each ingredient, varying the strength as he desires. All those elixirs that can be prepared quickly should be ordered made when called for. A classification of the basic or more complicated elixirs is desirable. There are about twelve or fifteen N. F. elixirs whose formula is such that more time is needed for their preparation than one usually has upon receipt of an order for some. These should be prepared beforehand, and might be designated as stock elixirs. From these the pharmacist can quickly make such other combinations as may be called for. Give the pharmacist every opportunity for exercising his knowledge and what he has spent years in learning. Let us have all the extemporaneous pharmacy possible. This

thing of pouring every prescription out of a stock bottle does pharmacy more harm than good. The shrewd and ever-watchful manufacturing houses quickly take advantage of the demand for ready-made prescriptions, and some have our shelves filled. It is a very common thing to find the various brands of the most simple elixirs on the druggist's shelves. It is so much easier to buy them than to make them; especially since the doctor falls easily into the habit of ordering special brands.

Let us quit advertising such simple elixirs as those of pot. brom., ammon. brom., buchu, coca, euonymus, grindelia, frangula and some others now official in our formulary. Let us inform our physicians that these various drugs are compatible with the aromatic elixir or the elix. taraxac. comp., making pleasant and palatable mixtures. This is all the information he wants. The strength of the mixture can well be left to him. He will thus write a real prescription that will give the pharmacist an opportunity for getting the dust off of his mortars, funnels, spatulas, scales, etc. It also cuts out the laity from buying these things direct, avoiding the doctor's charges. Instead of advertising to the physician the compound preparations, rather let us induce him to write out in detail his prescriptions. It will certainly protect himself, and will bring extra money into the coffers of the pharmacist. For just as sure as the nice compound preparations of the N. F. and the Pharmacopœia become popular and in general use, the manufacturer will step in and make them for us. They are only waiting until we have thoroughly advertised them. Let us get back to true pharmacy, even to the shot-gun prescriptions, rather than get completely into the ready-made, hand-me-down mixture way of doing things.

Acting Secretary Wilbert next presented in abstract a paper by A. B. Stevens, of Detroit, upon the subject of National Formulary Emulsions:

NOTES ON EMULSIONS.

BY A. B. STEVENS.

At the meeting of the National Formulary Committee at Hot Springs statements were made to the effect that 40 per cent. cod-liver oil emulsions would not separate as quickly as a 50 per cent. emulsion, and that the addition of 10 per cent. of alcohol was necessary as a preservative.

In order to obtain general information upon the subject, letters were addressed to a number of pharmacists many of whom were connected with manufacturing houses. A number replied that the addition of alcohol was necessary. Some recommended 10 per cent., others thought 6 per cent. sufficient; one advised to try 3.5 per cent. alcohol and 3 per cent. of glycerin. One advised the use of chloroform in place of alcohol, being a better preservative and less objectionable to the Food and Drug chemists. The general opinion was that a 50 per cent. emulsion would

not separate as quickly as a 40 per cent. emulsion. Several recommended the use of a small quantity of tragacanth to prevent separation. All objected to the use of Irish moss. After considering the above, a number of experiments were made, as follows:

Forty and fifty per cent. emulsions were made, using as emulsifying agents three mixtures containing tragacanth and acacia in the proportion of 1 to 9, 2 to 8 and 3 to 7. These were prepared in exactly the same manner, as well as duplicates containing 10 per cent. alcohol, 6 per cent. alcohol, 3.5 per cent. alcohol with 3 per cent. glycerin, 0.3 per cent., 0.6 per cent. and 1.2 per cent. of chloroform. These were then placed on a shelf and left undisturbed from January until July, at which time they were all carefully examined. All were in a perfect state of preservation, but this was also true of a sample containing no preservatives except the oils of birch and sassafras used as flavoring. Hence a longer time will be necessary to determine the relative value of the preservatives. None of the 50 per cent. emulsions showed any apparent separation, but were more fluid at the bottom than at the top. The 40 per cent. emulsions all separated into two layers, the upper emulsified oil forming about four-fifths of the whole. The greater the proportion of tragacanth present the firmer the emulsifying portion, but this seemed to have scarcely any effect upon the volume of the watery layer. The 40 per cent. emulsions containing 10 per cent. alcohol were more fluid and contained less volume of separated water than those containing less alcohol or glycerin. Those containing chloroform showed the greater amount of separation, but the odor and taste of the oil was less pronounced. Slight agitation of the 40 per cent. emulsions produced a homogeneous preparation which did not separate for days. It is possible that a 40 per cent. emulsion made with eggs or by means of a mechanical emulsifier may not separate as quickly as a 50 per cent. emulsion.

CONCLUSIONS.

Extemporaneous 50 per cent. emulsions do not separate as quickly as 40 per cent. emulsions.

Forty per cent. emulsions keep for some time without separation when they are easily mixed by simple agitation and have the advantage of being more fluid than a 50 per cent. emulsion.

Tragacanth thickens an emulsion but does not sufficiently improve the mixture to warrant its use.

The addition of 10 per cent. alcohol tends to prevent separation and would doubtless preserve emulsions that are to be kept for a long time, but is not necessary for extemporaneous emulsions.

The Chair invited discussion upon the paper just presented, but none was offered, and it was received and referred to take the usual course.

Mr. Wilbert next abstracted a paper upon the subject of broadening the usefulness of the National Formulary, the following being its full text:

BROADENING THE USEFULNESS OF THE NATIONAL FORMULARY.

BY FREDERIC E. NIECE, NEW YORK CITY.

While every effort is being made to more generally popularize the National Formulary by whatever means available, we, in our zeal to further its best interests are unfortunately overlooking one of its greatest resources for good. This so-called 'good' is anything that will broaden its usefulness and extend its power in more than the ordinary fields of pharmaceutical practice, providing we keep within the pale of its purposes.

By a system of well-organized propaganda activity using force and wisdom with telling marks, considerable success has been accomplished in the extension of its usefulness into the highways of medicine. The institution and careful execution of this work of unity has resulted in an outcome that promises to repay well for the effort. But in order to keep alive this good work, when propagandism will have ceased to be of further use, we must be alert to the situation and prepare to take up the cudgel and continue the interest until such time as its success no longer requires assistance.

In propaganda work much has been done, but considerably more has been learned. This is in regard to the existing relation the pharmacist holds toward the book.

Experience has taught those in charge of this work that now-a-days it is not so much the physician that needs the education along this line as it is our own brethren who are inclined to treat it with much disdain, for reasons that are as numerous as they are varied. The real cause, however, is either ignorance or lack of interest. But, be it as it may, we must consider this element and strive to appease their feelings, for it is this class in which pharmacy as a whole is so often dangerously reflected for there is nothing so misleading as ignorance. It is well to assume, however, that the N. F. stands pre-eminent as a work of reference and that it is really unknown to but a very few. But as to its intrinsic value, we fain with despair to state, that a great number look upon it more as a makeshift than a reality. To overcome this, broaden its usefulness. Cause this small army to respect it. Compel them to make use of it. Stir them up to a feeling of unsafety without it, and you will have accomplished all. In order to better appreciate its features we must know more of its virtues, for a book should never be judged by its title. Then again in order to broaden its usefulness we must first ascertain its shortcomings and then suggest the improvements. In offering the ways and means by which this broadening may be accomplished I can only suggest. The execution of the name is entirely within the hands of those chosen to consider

propositions. In this respect however, allow me to quote a few words from a paper written by Mr. C. L. Diehl under the caption of "The Evolution of the National Formulary"—which appeared in the 'Bulletin' as follows: . . . "that the question of additions or eliminations is decided mainly on the basis of commercial demands."

In lieu of this statement we should find no reasons why the next revision committee should not seriously consider the much-needed and sure-to-be-demanded additions as hereinafter suggested. Our objects should be to make its usefulness felt more keenly, for when a pharmacist is once interested he may then use it according to his talents in the interest of his immediate environments both medically and pharmaceutically. In the train of arguments, allow by way of suggestion the introduction of such formulæ in part two or part three as you will; a few or as many, as the case may be, of such reagents, solutions, stains, etc., used in laboratory methods of medical or clinical chemistry. They are numerous, to be sure, but all of them need not be considered from the "point of commercial necessity." Medical chemistry covers a number of well-defined sciences such as bacteriology, chemistry, pathology, etc. A few of the more commonly used solutions would be a grand acquisition to the book. The advent of medical chemistry into that of higher pharmacy demands that certain recognition be given its accessories. This is got to be expected. For, as we now find, many stores have arranged to do clinical work for physicians, either analyze their specimens or otherwise supply them with the solutions needed in the work.

The formulas of these solutions may be acquired by the druggist in two ways, either by the use of the N. F. or a library of expensive books.

The former way would be more preferable and profitable and in general more desirable.

In the smaller towns this would be regarded with satisfaction, for it is this class that is so often caused to realize the importance of these innovations.

In cities or towns where physicians are obliged to conduct their own clinical laboratories the druggist is often called upon to furnish a solution used in the work. It so often happens that after he consults the Pharmacopœia, and then by context the National Formulary and a few shelf-worn drug journals, his source of information is exhausted and tells the neighboring doctor he never heard of it, when as a matter of fact the same solution may have been in use for years. If the doctor is willing to wait, the druggist will no doubt appeal to his drug journal for assistance, which as a reply they give him, to all intentions, what he applies for, or a list of books in which the same may be found. The formulæ may or may not be just what the doctor desires, for the druggist in this case is not competent to judge in matters of this kind, and by reason of his lack of knowledge may have caused a wrong interpretation of the same and as such

convey it to the editor of the drug journal. If this solution is presented to the doctor, and we assume it to be not what he desires, imagine the results—loss of time, expense, annoyance and humiliation!

The druggist then prepares to buy the books as directed, even at all hazards. He gets one, two, or probably three volumes, all expensive, and after he has got what the doctor wants the usefulness of the books come to an end, not so much their virtues, but through the inexperience of the druggist, they have served their purposes. Now, how will the druggist recover? Surely he cannot ask the doctor to assume even half the burden of the expense. This may have to be repeated again; if so, conceive the impression this druggist will make on this physician. As a rule, matters of this kind cannot be delayed.

The one solution to all of this is the National Formulary. By reason of the same containing a number of selected formulas—a few rare, old and more recent ones—the bewildered druggist would have something to rely upon.

Can we offer a better helpmeet than this? We can best imagine the high esteem in which such a druggist would hold his then *vade mecum*.

In our present training we are taught to master the sciences—aside from practical and theoretical pharmacy—of chemistry, physics, botany, materia medica, biology, pharmacognosy, microscopy, toxicology, physiology, and bacteriology.

Does the present Formulary attempt to cover all of these? In reality it is more of a medical compilation than a pharmacal one—not offering this as a criticism, only as a statement of a fact. When we are called upon to supply the needs of the above sciences we never think of the N. F., for most of us know that we would get little assistance from such a source. All of this requires no discussion. The facts are too well known to us all. But if we are in earnest about the welfare of the coming future of the N. F. we should remove the ban of pharmacal constriction and go a little beyond the bonds and incorporate such things that are of direct interest to pharmacy but yet not of pharmacal origin but requires a knowledge of pharmacy for their production. If our aims are to evoke medical interest, we have an excellent means right in the suggestion. There is no better way to deal with our medical friends than with implements of their own creation.

Our ideas pharmaceutically have wrought havoc with our best intentions since we have been too ethical in this respect.

More life and liberty to the N. F. This is what should be encouraged. By life propaganda work is well nigh perfect. As to liberty, make it broader in its usefulness. Incorporate formulæ that are used in such distinct studies as those of Bacteriology, Hematology, Pathology, Gastrology and Urinology. It is well worth the experiment. In this forethought it is nigh to impossible to give even an outline as to what would be best suited for incorporation.

This, a matter for the committee to decide upon. Suggestions can only be given here in a more general way. But as an instance of the importance of these suggestions I beg to offer in evidence the following matters of record.

The fourth edition of the Swiss Pharmacopœia contains a chapter of five pages on " Reagents for Medical Chemistry," of which the following abstract will show: for which I am indebted to Mr. Otto Raubenheimer, of Brooklyn, N. Y.

A. Reagents for urinalysis, viz.:
Albumin, Albumose, Glucose.
Pentose, Acetone, Bile, Urobilin.
Indican, Blood, Diazo and Iodine.

B. Reagents for the examination of Gastric Contents.

C. Reagents for the examination of blood.

D. Permanent solutions for staining bacteria and various protozoa.

In the formulary of the Dresden (Germany) Apotheker Verein formulas for solutions for the estimation of albumin, the detection of glucose and the physiological salt solution are incorporated.

The Russian pharmacopœia gives a long list of formulæ used in medical chemistry.

Our U. S. P. gives that of Fehling's Solution for sugar determinations. We cannot favor the introduction of these solutions into our pharmacopœia so long as we have our N. F. in existence. Since the N. F. will not be establishing a precedence, and cannot be held as an exception to the rule as evinced by the above pharmacopœia, we may have cause for argument. I have been often asked by dentists, doctors and druggists if the U. S. P. or N. F. contained such formulas for solutions as Squibb's Hypobromite or Rice's modification, Foison's fluid, Wright or Jenner's stain for blood or Topfer's reagents for gastric analysis. On being told they were not, they seemed amazed, but showed an unwillingness to go and consult them to be convinced as happened in the case with the druggist.

The setting-aside of a few pages devoted to formulæ of this nature would relieve all of this and form an inseparable existence for the book. This would tend to broaden its usefulness in other fields of scientific activity, and thus create a standing of distinctiveness.

In short, will the book warrant the additions, or will the additions destroy the purpose of the book?

With that the question rests.

1328 Teller Ave., N. Y.

This paper also, without objection, was ordered to take the usual course.

A paper in the nature of a criticism upon the National Formulary, by H. G. Posey, of New Orleans, was next called for.

Mr. Asher stated that as he understood the rule, where the author of a

paper was not present it was simply to be read by title and referred, and he supposed it would be proper to follow the rule in this case.

The Chair agreed in this view, and Mr. Wilbert so moved, as the paper was a long one and no synopsis accompanied it. So ordered.

The text of the paper here follows:

THE NATIONAL FORMULARY: A CRITICISM.

BY H. G. POSEY, NEW ORLEANS, LA.

A critical review of the National Formulary is in order, in view of the fact that a new revision is now in process of construction, and it occurs to the writer that any number of changes both in the text and in the construction of some of the formulæ should be requested of the committee by the persons who have most frequently use for the book—viz. the retail pharmacists. The National Formulary was without doubt one of the best things ever done by the American Pharmaceutical Association and while its present size is an evidence of its great value to pharmacists generally it has a number of formulæ which give evidence of undue haste on the part of the revisers. The text also contains quite an appreciable amount of unnecessary verbiage which we should rather expect to find in the various works on pharmacy than in a formula book, for instance the passages descriptive and explanatory of emulsa, pilulæ, pulveres, etc., and which could readily be dispensed with thereby reducing or rather minimizing the chances of the book becoming too bulky. We are treated to a dissertation on the "successful formation of emulsions" which abounds in platitudes. Every one of us has gone through the same thing in Remington, Coblentz, Caspari, Heebner and others, and those of us fortunate enough to have had the privilege of disarranging the alphabet behind our names have undoubtedly had drilled into us by our professors and laboratory chiefs, just the exact words used in the said chapter on emulsions.

Let us turn to pilulæ—we find two pages devoted to such facts as "pills are round, oval or ovoid forms of medicinal substances, and weighing not less than 0.06 Gm. (1 grain), nor more than 0.5 Gm. (8 grains). If they weigh less than 0.06 Gm. (1 grain), and not more than 0.02 Gm. (⅓ grain) they ure known as "granules"; if below the latter in weight they are usually designated as "parvules," and "in their simplest form, pills are prepared as required" etc., all of which is entirely unnecessary, as a pill is a pill whether it weighs ⅛ grain or 8 grains, and it is not the office of the N. F. Committee to designate them "granules" or "parvules" because various manufacturing concerns have chosen those terms for a few of their products, nor does it seem necessary to the writer for the committee to exhaustively detail the various modes of pill coating and finishing, such information being the province of the various pharmaceutical text-books.

And then again as Geo. M. Beringer (Proc. New Jersey Pharmaceutical

Association, 1907) has pointed out, "it is safe to venture the assertion that no manufacturer uses this method of sugar (or other) coating on a commercial scale. Yet this is the *only legal standard* for sugar (or other) coated pills." Who knows what might happen if an over zealous food official of any one of the states chose to get busy with a few pill manufacturers because, forsooth, their pills were not officially coated. In this connection also can be mentioned the text covered by the title pulveres and the sub-titles pulveres in chartulis; pulveres in capsulis amylaceis; pulveres in capsulis gelatini and pulveres in tablettis, (tablettæ orales). The instructions concerning fluidextracta should omit the description of the relation of volume to weight, for in the forthcoming edition it seems to be an understood fact that alternative weights and measures are to be omitted entirely and only the metric system used, which fact is beyond any doubt whatever a step in the right direction. The nomenclature of the book is open to discussion in that a great number of the titles are so bulky or so long drawn out that it is manifestly out of the question to ask a busy practitioner to write them on his prescription blank to say nothing of memorizing them, unless he were a latin scholar, for instance; Pulvis Salis Kissingensis Factitii Effervescens, Pulvis Salis Vichyanii Factitii Effervescens cum Lithio, et id omnes genus ad nauseam, and others are misleading and untrue.

Particular attention should be paid to the quantities of alcohol and the substances enumerated in Regulation 28 of the federal food and drugs act, the former being shown by percentage, and the latter being expressed both "in grains or minims per ounce or fluidounce" and "grams or cubic centimeters per kilogram or per liter," as per Regulation 30.

In regard to identity standards for articles in the National Formulary for which there is no standard, either in the U. S. P. or other recognized works, the writer believes that the introduction into the Formulary of short, concise descriptions or definitions, and tests of identity and strengths of purity, as mentioned by the Report of the Committee on National Formulary, at the 1908 meeting, would subserve all interests.

To request the Pharmacopœial Committee to introduce them into the Pharmacopœia would be neither wise nor just, nor would it serve any better purpose, for under the federal and nearly all of the state laws the National Formulary is just as much a book of standards as is the United States Pharmacopœia. The work now being done by the sub-committees in respect of the alcoholic strength of elixirs; the advisability of the use of saccharin as a sweetening agent; and in regard to some method of producing uniformity of color is in good hands and we can safely look forward to that work being well done. The writer confesses, however, that he is not enthusiastic about the Feil "color chart" method, for the reason that the small pharmacist will never equip himself with a Prang color chart, and the busy pharmacist who (as so often happens) has to make up a N.

F. preparation in a hurry will most probably, for lack of time, neglect to compare his preparation with the specified color. Let us have a definite quantity of a properly macerated or percolated tinctorial liquid.

The last revision committee seemed to think that "any old" modification would answer the purpose of a formula for a preparation official in a foreign pharmacopœia.

Let us hope that the present committee thinks differently, and if we must have a few foreign formulæ let them be accurate. Really the incorporation of foreign formulæ serves no great number of pharmacists, for most of us who enjoy any foreign business or have a demand for the preparation of the foreign pharmacopœias could not get along with the few formulæ incorporated in the N. F., but are compelled to add to our library the pharmacopœias necessary.

According to the writer's way of thinking when prescriptions or orders are received for preparations official in foreign pharmacopœias the preparation of that particular pharmacopœia is intended and the intent should be complied with.

By all means the committee should follow the recommendations:

1. That the title-page of the National Formulary should omit the words "of unofficial preparations" and the title should be simply "The National Formulary."

2. That the nomenclature and the titles of the N. F. should be in harmony (and correspond) with those of the U. S. P.

3. Titles and synonyms not official should conform to modern ideas of chemistry.

4. Synonyms or English titles should agree with the Latin titles.

5. N. F. titles should be descriptive of the true composition of the preparations. (See Kebler's criticisms before a meeting of the City of Washington branch A. Ph. A.)

6. The introduction of therapeutic or anatomical names in the future should be prohibited, and present therapeutic titles be eliminated as far as is practicable (vide Balsamum Traumaticum, Mistura Adstringens et Escharotica, Mistura Carminativa, Mistura Contra Diarrhœam, Mistura Pectoralis, Mistura Splenetica, et als).

7. The method of citing botanical sources and authorities should be made to conform to modern botanical nomenclature.

8. A record of publication should appear on the title-page to the N. F.

9. Authority should be given to the committee to establish a specific date on which the next edition of the N. F. should go into effect.

10. That a statement be inserted in the preface to the effect that the National Formulary does not assume any responsibility for the therapeutic value of any preparation, and that the question of additions or eliminations be decided mainly on the basis of commercial demands. This recommendation covers the reasons for including such formulæ as Elixir

Digestivum Compositum and Pulvis Pepsini Compositus, both of which titles, however, should be changed to conform to modern ideas of nomenclature. We may all be familiar with the work of the Council on Pharmacy and Chemistry of the American Medical Association, and their request to our Association to omit the above preparations, or any others containing pepsin and pancreatin in combination, acid or alkaline, with or without ptyalin or diastase, and technically we know that they are right as to the effect produced on each by these substances, also that the elixir and powder are therapeutically of no value, still as business men we *do know* that there exists a well-defined demand for both lactated pepsin and an elixir of lactated pepsin, and the writer believes that the committee should heed that demand and include formulas for both.

Some discussion has been anticipated in regard to the admission into the book of patented or proprietary articles. The writer is unqualifiedly opposed to the admission of any preparation or preparations, substance or substances protected by patent or copyright. Not only for the reasons already set forth by the U. S. P. Committee of Revision, but for the fact of the "boost" and advertising which it would give, as well as for the fact that commercialism should be foreign to the book and no good could come of its exploitation by some enterprising manufacturer whose product had been admitted thereto. We would then be in the apparent position of guaranteeing that particular manufacturer's product against any other.

So much for the generalities and the errors and peculiarities of the book.

The formulas which, in the opinion of the writer, are faulty will now be taken up, and whatever criticisms are accorded them, or whatever the manner in which they are assailed. the reason will be their lack of practicability to the busy pharmacist or prescriptionist, as well as to any other contributing factors which manifest themselves in the particular formula under criticism.

Acidum Citricum Saccharatum and Acidum Tartaricum Saccharatum.—Both these substances should be dropped and instructions covering the manufacture of both could be incorporated under the heading "Pulveres Effervescentes." See note on page 131.

Acidum Hypophosphorosum.—This substance is official in the U. S. P. and, consequently, should be omitted.

Balsamum Traumaticum.—The writer absolutely fails to see the necessity for this preparation, for the official Compound Tincture of Benzoin not only replaces it perfectly but is almost identical.

Bismuthi Oxidum Hydratum is an article of commerce easily obtainable, and as the formula involves considerable manipulation and technique, and does not make a satisfactory "Cremor Bismuthi" when titrated with water, it should be dropped and a formula introduced for a cream or milk of bismuth containing approximately 2½ grains to the fluidrachm of the

combined hydrated oxide and subcarbonate. In that connection the writer suggests to the committee that the greater the volume of water used to effect solution and precipitation, the finer and lighter the precipitate. The present formulæ does not yield a bulky precipitate.

Boroglycerinum.—Why is this product necessary? Its advantage over the official glycerite of boroglycerin is not apparent, as its density is too great to permit of its easy handling and in a measure precludes its being readily soluble.

Elixir Acidi Salicylici.—This elixir bears out the assertion of the writer, expressed in the first part of this paper, that the committee did not make haste slowly. It does not seem possible to make a stable elixir of salicylic acid containing 40 grains to the ounce, even with the aid of potassium citrate and glycerin. A critical analysis of the reasons for this particular one of the eighty-eight elixirs of the National Formulary would certainly be interesting, in view of the fact that it is a faulty formula and a comparatively unused one.

Therapeutically the sodium salt of salicylic acid is far preferable, and a very popular proprietary elixir, as well as several others bearing the same name, the products of the laboratories of the large manufacturing concerns, contain added sodium bicarbonate, as well as cimicifuga and gelsemium, thereby really making a compound elixir of sodium salicylate instead of elixir salicylic acid. Is the present formula true to its name? Does not the potassium citrate react with the salicylic acid to form a salt? The writer thinks so, and therefore suggests that the formula for elixir sodium salicylate compound be inserted and the present one dropped.

Elixir Ammonii Valerianatis.—Title should be changed to Valerate in conformity with modern nomenclature, and as a modern usage and custom demands a red elixir, tincture of cudbear should replace the compound tincture of cudbear as the coloring agent.

Elixir Ammonii Valerianatis et Quininæ serves no good purpose and should be omitted.

Elixir Anisi.—No good reason exists for such a pharmaceutical curiosity as this preparation; besides its name is a misnomer, and as for its odor and flavor, well, the less said the better. It is *not* an elixir of anise, and is misbranded within the meaning of the food and drugs act.

Elixir Buchu, Buchu Compositum, and *Buchu et Potassii Acetatis,* all seem to be very good formulas, but as a well-defined demand exists for an elixir of buchu, juniper and potassium acetate, the committee would do well to incorporate a formula therefor and omit the last of the present buchu trinity.

Elixir Caffeinæ.—This title indicates it to be an elixir of caffeine. Really it is an elixir of caffeine hydrobromide and caffeine. Why is the acid added? Cook (Am. J. Ph., 1908, p. 337), claims that the quantity of aromatic elixir directed is insufficient to effect solution. The writer has

has had no such trouble, but does notice a separation of the oils in the aromatic elixir.

Elixir Calcii Lactophosphatis.—Dissolve the calcium salt in the acid; then add the other ingredients.

Elixir Catharticum Compositum.—As quite an amount of sediment occurs in this preparation, talcum should be added.

Elixir Cinchonæ.—Kebler (Bulletin A. Ph. A., Apr., 1909, p. 120), points out the fact that this preparation, among others, is misbranded under the food and drugs act, in that it is an elixir of cinchona. It is an elixir of cinchona alkaloids, and is one of the most generally satisfactory formulas in the book, but if we must label a preparation with its true name, we shall have to change the title of this one, or introduce an elixir made with the detannated fluidextract; this holds good, of course, with all the cinchona combinations into which this elixir enters.

Elixir Curacao.—As this elixir has no great popularity, and as oil of curacao orange is a commercial impossibility it might be well to dismiss this formula.

Elixir Digestivum Compositum.—This formula yields a satisfactory appearing elixir, but it cannot be reconciled to the formulas now in general use by manufacturers who are supplying this product. Prices are based on an elixir containing 40 grains of lactated pepsin to the fluid-ounce, every manufacturer's list being the same in that respect. Why then cannot the committee agree upon a formula which represents that amount of lactated pepsin dissolved in the required quantity of elixir and glycerin, or failing that, change the quantities of pepsin and pancreatin to the proper ratio, instead of permitting the excess of pepsin as now. The quantities would then be

Pepsin saccharated	15 Gm.
Pancreatin U. S. P.	15 Gm.
Diastase	1 Gm.
Lactic acid U. S. P	1 Gm.
Hydrochloric acid U. S. P.	2 Cc.
Glycerin	250 Cc.
Tincture of cudbear N. F	15 Cc.
Purified talc	15 Gm.
Aromatic elixir U. S. P. a sufficient quantity to make	1000 Cc.

With such a formula it would be possible for us to compete with some of the manufacturers as to prices, for we could then reduce our present cost of manufacture owing to the fact that as the formula now stands it contains 10 Gms. (154.3 grains) of $\frac{1}{3000}$ pepsin as against 15 Gms. (231.5 grains) of saccharated pepsin, $\frac{1}{300}$ in the commercial formula.

Elixir Ferri Lactatis.—Present formula is faulty and should be replaced by reconstructed formula (Bulletin A. Ph. A., Vol. 7, pp. 158).

Elixir Ferri, Quininæ et Strychninæ.—The title should read elixir ferri citro-chloridi, quininæ et strychninæ for obvious reasons.

Elixir Frangulæ.—Should be filtered through talc.

Elixir Gentianæ.—The present formula is too troublesome and requires entirely too much time. Detannated fluidextract of gentian can be used to good advantage and will simplify things generally in so far as this product is concerned.

Elixir Gentianæ cum Tinctura Ferri Chloridi.—Title should be changed to show the citro-chloride.

Elixir Gentianæ Glycerinatum.—So many mean things have already been said of this formula, that the writer despairs of saying more. Why it should contain acetic ether and saccharin, and why 40 per cent. of glycerin is necessary, is certainly one of the anomalies of the book. The formula is badly in need of revision.

Elixir Glycyrrhizæ.—Should be omitted owing to its close similarity to elixir adjuvans U. S. P.

Elixir Glycerophosphatum.—The experience of every one who attempts this elixir is that the salts are very slowly soluble, and subsequently throw down a precipitate. It is not only necessary to have an acid calcium glycerophosphate, according to Dunning, (Proc. A. Ph. A. ———) but an excess of phosphoric acid ; otherwise an unstable elixir results. Even using an acid salt, the writer finds the specified quantity of acid insufficient, and lactic acid 2 Cc. should be added.

Elixir Paraldehydi—It is recommended that the alcohol content be increased to fifty per cent. by volume, and that the oils and tincture of cardamom be triturated with talc before adding the aromatic elixir. The present quantity of alcohol is insufficient to hold the paraldehyde in solution.

Elixir Pepsini et Bismuthi.—Presumably the committee meant to improve this preparation by publishing a reconstructed formula (Bull. A. Ph. A., vol. 11, page 158), but just why the new formula is better than the old is rather hard to understand. Surely, if we have a solution of pepsin in glycerin (glycerite of pepsin) we can make up the elixir much quicker than we could by waiting for the pepsin to dissolve before proceeding further.

Elixir Quininæ et Phosphatum Compositum.—The writer agrees thoroughly with the criticism of Cook (Amer. Jour. Pharm., vol. 80, page 339, 1908) and suggests that the committee omit this preparation entirely.

Elixir Rhamni Purshianæ Compositum.—Talc should be added as a clarifying and filtering agent. This applies to all the formulas containing fluidextracts, for the reason of their being more or less loaded with extractive matter, soluble only in proportionately stronger alcoholic menstrua than aromatic elixir.

Elixir Terpini Hydratis.—The disturbing factor in this formula is the syrup, and it should be omitted. A heavy crystalline deposit manifests itself in this elixir, but upon examination it will be found to be sugar.

The writer at first supposed that it was the terpin hydrate, but as the crop of crystals increased he felt sure that the sugar was the cause. Simple solution in water solved the question, but not before resort was had to both chemical means and the polariscope. The alcoholic content is not too great, and both alcohol and glycerin are necessary to hold the terpin hydrate in solution. Water should take the place of syrup in this formula.

Elixir Terpini Hydratis cum Heroina.—A sufficient amount of caramel or compound tincture of cudbear should be added to produce a definite shade of color, both in order to distinguish this from the elixir containing codeine and because custom demands a light brownish product.

Elixir Zinci Valerianatis could be advantageously dropped. If, however, it is continued, the title should be changed in harmony with modern nomenclature.

While on the subject of elixirs, the thought manifests itself that there are quite a number of the present elixirs that are out of date, or for which there is no demand and which could be well dismissed and in their place could be substituted formulæ for such popular combinations as di-ethyl-barbituric acid, hexamethylene compound, glycerophosphates compound, glycerophosphates compound with pepsin and calisaya, saw palmetto and santal, terpin hydrate and heroin with creosote and others.

Emplastra.—Aromatic plasters and compound tar plaster, could be well omitted.

Emulsa.—The remarks of the first portion of this paper apply to this title, and in addition the recommendation is made that the chapter under the sub-title Emulsa Symbolica be entirely omitted, as experience has proven that any other emulsifying agents than acacia have been uniformly unsatisfactory, and aside from that would tend to create a lack of uniformity, thereby lessening the very object which the book is intended to accomplish. Each formula should have a definite quantity of flavoring agent appended to it for the same reason; if not some trouble might ensue as a result of the same emulsion being flavored with different substances in different localities. The writer really thinks that three of the six cod-liver oil emulsions could well be dispensed with, leaving the emulsion of cod-liver oil with extract of malt, and the emulsion of cod-liver oil with wild cherry, and adding a formula for an egg emulsion of cod-liver oil, consisting essentially of eggs, brandy and cod-liver oil.

Emulsum Petrolei, is one of the poorest formulas in the whole book. To call it an emulsion of petroleum is a joke, particularly as it only contains five per cent. of that substance. The admixture of such complex organic substances as expressed oil of almond, acacia and tragacanth, with sugar (syrup), and alcohol in the presence of water, strikes one at once with being the poorest kind of judgment, particularly when we remember how prone the oil is to become rancid.

By replacing the cod-liver oil with an equal volume of petrolatum

liquidum, U. S. P., an excellent emulsion of petroleum can be made by the U. S. formula for emulsum olei morrhuæ, and the suggestion is made to the N. F. committee to try it.

Essentia Pepsini.—This formula is susceptible of two corrections, the first being the excess of pepsin, and the second the use of Angelica or Malaga wine, decolorized with bone black. Commercially nearly all the pepsin essences contain 1 grain of pepsin to each fluidram.

Extractum Glycyrrhizæ Depuratum.—As purified extract of licorice is now official in the U. S. P. it should be dropped.

Ferri Hypophosphis is an article of commerce easily obtainable and should be omitted.

FLUIDEXTRACTA.

With but few exceptions the fluidextracts seem to be uniformly satisfactory, the general directions as to processes, or methods of percolation, as well as to menstruum to be used while a trifle long, are necessary owing to the explicit and exact methods which they describe.

"The method of citing botanical sources and authorities by the final addition in brackets of the common or English name of the plant, grates harshly on the minds of those who are accustomed to see and use botanical binomials correctly. This is particularly noticeable in the section devoted to fluidextracts. As an example: 'From the bark of the root of Cornus Florida Linné (dogwood),' would be more correctly stated. From the root of dogwood, Cornus Florida Linné (G. M. Beringer, Proc. N. J. bark of Ph. Assoc. (1907).

Exception might be taken to such titles as Fluidextractum Aletridis, Fluidextractum Camelliæ (instead of Theæ) and Fluidextractum Convallariæ, the title of which should be Fluidextractun Convallariæ Florum, in order not to conflict with the pharmacopœial preparation.

Gelatinum Chondri could well be omitted.

Gossypium Stypticum, *Infusum Rosæ Compositum* and *Iodoformum Aromatisatum* are all of very little use, and should be dropped.

Liquor Ammonii Acetatis Concentratus should find no place in this book, for beside being an unstable compound, it conflicts with the pharmacopœial directions, "that the preparation should be made fresh."

Liquor Ammonii Citratis Fortior, should also be dropped for practically the same reason, and also for the reason that the appended note is entirely incorrect, as reference to the British Pharmacopœia will show.

Liquor Antigerminarius is not near so good a germicide as is *Liquor Antisepticus*, U. S. P., and would not be missed.

Liquor Antisepticus Alkalinus.—The proportion of glycerin should be should be reduced to 125 Cc.

Linimentum Ammonii Iodidi.—The "oil of lavender" in this preparation should be oil of lavender flowers.

Linimentum Iodi can be made quicker by dissolving the potassium salt in the water, then the iodine in this solution adding the glycerin and alcohol last.

Linimentum Opii Compositum.—Canada liniment can be materially improved by the addition of egg albumen and the reduction of the quantity of turpentine.

Linimentum Saponato Camphoratum.—The "note" should be omitted or corrected for the reason that it is in error, as solid opodeldoc is *not* directed by the Ph. G. to be "prepared with soap made from animal fats," but from medizinische Seife, a soap prepared from lard and olive oil and official under the title Sapo Medicatus.

Liquor Extracti Glycyrrhizæ.—The writer has often wondered what good purpose this preparation was intended for, or rather what advantage it possesses over pure extract of licorice, or fluidextract of licorice. If the drug were one which depended upon a definite proximate principle for its therapeutic valuation, and therefore necessarily demanded a standardization, the drying to constant weight to determine the percentage of moisture, would be a necessity, but why such a proceeding is required, and why this formula is inserted is rather a hard question to answer. "The mountain labored and brought forth a mouse."

Liquor Ferri Albuminati.—Neither the present formula nor the reconstructed formula ("Bulletin A. Ph. A.," vol. 2, p. 157), yields a satisfactory preparation, and the committee would do well to look into the Harrison formula, given in full in a paper read before the Chicago Branch A. Ph. A. (see "Bulletin A. Ph. A.," May, 1908), as it gives entire satisfaction, its only difficulty being the time and technic required.

Liquor Ferri Iodidi.—It is an open question as to whether or not syrup of ferrous iodide should be prepared extemporaneously owing to the oxidation of this solution unless perfectly preserved, but as there are many who do use a similar preparation made by the larger manufacturing houses the the writer advocates continuing this formula.

An increase in the amount of acid should be made, however, in order to reconcile the resulting syrup to that of the U. S. P.

Liquor Ferri Oxychloridi should be dropped; also *Liquor Ferri Oxysulphatis.*

Liquor Ferri Peptonati, and its combination with manganese, should be given not only the earnest consideration of the committee, but the closest possible attention. Both formulas are notoriously defective, and produce, as has been pointed out by several writers, anything but nice preparations. The writer has obtained exceptionally fine products by the use of the Harrison formula ("Bulletin A. Ph. A.," vol. 3, No. 5), using phenol water, as suggested by the late Dr. Squibb to prevent putrefactive changes due to the presence of incomplete chemical combination or of an excess of albumin in the process of making the fresh peptone. Excellent results have also

been obtained with the formula of Stanislaus (Proc. Penna. Assoc., 1908), not so good, however, as with the Harrison process. The writer's judgment leads him to think that aromatic elixir is entirely out of place in any formula for this preparation, and should not form a part of it.

Liquor Hypophosphitum and *Liquor Hypophosphitum Compositus* are very good preparations, but as a demand exists for a solution of hypophosphites with creosote, a formula should be included for same, containing 4 minims of beechwood creosote to each fluidounce, it being hardly possible to effect solution with quantities greater than that.

Liquor Magnesii Sulphatis Effervescens.—It hardly seems possible that an active demand is manifest for this preparation, particularly as it can hardly be sold in place of solution of magnesium citrate, of which it is a close congener, and the same might be said of Liquor Sodii Citro-Tartratis Effervescens. Seemingly both formulas could well be omitted.

Liquor Morphinæ Citratis and *Liquor Morphinæ Hypodermicus* are both back numbers.

Liquor Phosphatum Acidus.—It is almost out of the question to consider this a good formula, and the committee could do much better by incorporating a formula containing the chemicals instead of deriving the phosphates from the bone ash with the aid of sulphuric acid.

Liquor Picis Alkalinus.—It has always excited the curiosity of the writer as to the purpose this preparation was given a place in the book. After an acquaintance of several years with tar and its many combinations, he does not recall ever having met this preparation. We could use with great pleasure a formula for liquor carbonis detergens, and would feel grateful to the committee for same.

Liquor Potassii Arsenatis et Bromidi.—In consequence with the pharmacopæial requirement of 1 per cent. for the arsenic solutions, this preparation should contain 1 Gm. in 100 Gm., and not 1 Gm. in 100 Cc., as at present.

Liquor Seriparus serves no good purpose now that rennin is an article of commerce easily obtainable, and should be discarded.

Liquor Sodii Arsenatis Pearson.—The French Codex, from which this formula is taken requires parts by weight, and the formula to be correct should read 1 Gm. in 600 Gm.. and not 1 Gm. in 600 Cc.

Liquor Strychninæ Acetatis.—In another one of the solutions which could be dispensed with. both by reason of its being of so little use and because of the danger of preparations of potent alkaloidal substances of such strength being placed in the wrong hands.

Liquor Zinci et Alumini Compositus and *Liquor Zinci et Ferri Compositus.*—The first is an excellent preparation and gives very great satisfaction; the second is not a satisfactory preparation, as it cannot be generally used on account of the iron sulphate and copper sulphate, both of which preclude the possibility of using it as a disinfectant of fabrics of any kind.

Lotio Adstringens.—Title should be changed, and really the preparation is of so little use that it might be dropped and not be missed.

Magma Magnesiæ.—Repeated trials with this formula have failed to produce a satisfactory preparation. Caldwell (Practical Druggist, Feb., '07) mixes the solutions after heat has been applied, and while still hot. Sennewald (Bull. A. Ph. A., Nov., 1907) has trouble to gather up magma on a straining cloth, owing to its retention of water, and other writers make the same complaint. The writer's greatest trouble has not only been to deprive the magma of water on a straining cloth, but to make a white preparation similar to those put out under proprietary names. As suggested by Raubenheimer (Bull. A. Ph. A., Nov., 1907), "a process should be given for freeing the wash water from organic matter," and the precipitation and washing should be carried on in a graduated and covered vessel (for if the magma is drained in the open air it will absorb CO_2), and when the last wash water has been siphoned off it will then be easy to add sufficient water to bring the volume up to 1000 A. C.

It might also be of interest to know that instead of 250 Gm. $MgSO_4 + 7H_2O$, the quantity should be reduced to 224 Gm.

Mistura Acaciæ.—This preparation was official in Ph. G. I., but it is not included in the present revision, and as it is of very limited use, should be dropped.

Mistura Adstringens et Escharotica.—Title should be changed. Precipitate should not be removed.

Mistura Ammonii Chloridi.—Pure extract of licorice, U. S. P., should be used.

Mistura Chlorali et Potassii Bromidi is an excellent formula if properly handled, and should not be altered or modified.

Mistura Oleo-Balsamica.—The unwarranted liberties taken with foreign pharmacopœias is manifested most glaringly in this formula, and also in any number of others. It does not seem proper to change the formulas of either of the foreign pharmacopœias, and it would not only seem to be just and equitable, but to be the part of excellent wisdom to have them properly stated if they are to find a place in the N. F., otherwise the reference to their source should be absent. The committee should admit the Ph. G. formula in its entirety.

Mistura Olei Picis.—The purified extract of licorice should be replaced by the corresponding U. S. P. product.

Mistura Pectoralis, Stokes.—Therapeutic titles are out of place, consequently this one should be replaced by the title indicative of its composition. Caldwell (Pract. Drugg., 1906), suggests that a solution be made of the ammonium carbonate in water, the fluidextracts added, then alcohol amounting to five per cent. of the finished product, a like amount of glycerin; then add the camphorated tincture of opium, and filter through magnesium carbonate, finally adding the syrup.

Mistura Splenetica.—Title should be changed.

Olea Infusa.—This general formula for infused oils is an improvement over that of the Ph G., in that the herb is macerated with ammonia and alcohol, before infusing in the oil. The use of a mixture of cottonseed and lard oils, however, is to be strongly condemned, as it is a well-known fact that such oleaginous mixtures are prone to rancidity.

The last paragraph of the " note " appended to this formula, should be omitted, as it is manifestly unfair to the Ph. G. to say the above process is to be used for the preparation of oleum hyoscyami, G. P.

Oleum Hyoscyami Compositum.—Taken from any point of view whatever to call this preparation balsamum tranquillans is wrong, as it is by no means a similar preparation, except insomuch as it contains infused oil of hyoscyamus. To say that a preparation consisting of the volatile oils of wormwood, lavender, rosemary, sage and thyme added to infused oil of hyoscyamus, is equivalent in therapeutic value to one consisting of belladonna, tobacco, henbane, poppy, black nightshade, stramonium, wormwood, sweet marjoram, St. John's wort, thyme, hyssop, peppermint, rue, rosemary, costmary, sage, elder and lavender herbs and flowers infused in olive oil, as is directed by the French Codex, is certainly taking a great liberty with the intelligence of a class of men who have devoted years of application and study in order to perfect themselves in the curative art. True, we might say that this preparation as made by the Codex smacks of Democrates, or of Æsculapius and Dioscorides, in that it is too bulky and has some of the elements of the " hit or miss " idea, but be that as it may, we who formed its acquaintance in early years, and who have grown up with it, knowing its effectiveness, have no desire to have thrust upon us a simplified preparation. How or why it relieves pain, causing it to be thereby a valuable therapeutic agent, concerns us not so much as the fact that it does, and that if it must form a part of the National Formulary, it should be accepted in its entirety, or at most only those few botanical substances composing it which are unobtainable in our markets should be replaced by substances closely allied. It is of course out of the question to make a preparation from the oils which can in any way approach that made from the infused drugs ; therefore the formula should be either changed to correspond with the Codex, or if retained the subtitle or synonym should be omitted.

Pasta Dermatologicæ.—The writer has had the same trouble with Lassar's zinc paste as have other writers (Raubenheimer, Bull. A. Ph. A., Nov., 1907, 349), and suggests the advisability of replacing the white petrolatum with yellow, as it is customary in all European countries to use yellow petrolatum as a base for this preparation.

Pepsinum Aromaticum should be dropped, as it is of too little value to find a place in the book.

Petrolatum Saponatum Liquidum is an excellent preparation, as is also

its congener, Petrolatum Saponatum Spissum, but formulas should also be appended for an iodine preparation (liquid) containing 10 per cent. and a mercury preparation (hard) containing 50 per cent.

Pilulæ ad Prandium should be omitted, as the official pill of aloes and mastic is quite sufficient.

Pulvis Acaciæ Compositus is not Pulvis Gummosus, Ph. G., unless the quantities of licorice and sugar be changed to correspond with that authority.

Pulvis Aloes et Canellæ should be dropped.

Pulvis Anticatarrhalis should be dropped.

Pulvis Cretæ Aromaticus.—If this preparation is to be retained the formula should be reconciled to that of the B. P., or the foot-note omitted.

Pulvis Hydrargyri Chloridi Mitis et Jalapæ serves no good purpose, and should be omitted.

Species Emollientes.—The Ph. G. formula includes melilot, and under the title Herba Meliloti defines that substance as melilota officinalis; therefore, if the authority for this preparation is quoted, the footnote should be corrected. The other two formulas for species should be given attention also, for while both bear the authority of the Ph. G., neither are in accordance with the formulas given in that book.

Spiritus Aromaticus should be omitted and compound spirit of orange, U. S. P., in the proper proportion used to replace it in any formula into which it enters.

Spiritus Curassao.—Repeated attempts to procure oil of Curacao orange having proven futile both to the writer and others, it is suggested that this formula be omitted, and one inserted in its place having as its base the essential oil derived from Citrus nobilis, or Mandarin orange.

Spongia Compressa should be omitted.

Syrupus Actaeæ Compositus would be more correctly stated as Syrupus Cimicifugæ, and would not then wound the sensibilities of those of us who are fond of stating botanical sources correctly.

Syrupus Bromidorum could be much more appropriately termed Syrupus Bromidi Compositus, that title being much more in keeping with its composition than is the present one.

Syrupus Glycyrrhizæ.—A much nicer, better flavored and more permanent preparation is made by percolating ground licorice root with a weak (0.1 per cent.) solution of ammonium carbonate, evaporating to 250 Cc. and dissolving 850 Gm. of sugar in the liquid (Scoville, Bulletin of Pharmacy 1907, 391).

Syrupus Hydrochlorophosphatum.—According to Nitardy (Bulletin A. Ph. A. 1907, 381–382), "it has been found impossible to prepare this syrup according to the N. F. directions of manipulation." He suggests that "the citric acid be dissolved in the water alone and the phosphoric

acid added. The magnesium and calcium carbonates and the potassium bicarbonate may then be dissolved in this solution, which must be gently warmed to expel CO_2. The alkaloidal salts are dissolved in the orange-flower water, the soluble ferric phosphate in 100 Cc. of hot water. These two solutions are added to the first, mixed, filtered, and brought up to the measure of 470 Cc. The sugar is dissolved in the filtrate, the glycerin added, and finally enough distilled water to make 1000 Cc."

The title of this syrup seems to be a misnomer, and in the opinion of the writer it is misbranded under the food and drugs act, for the reason that it can scarcely be called a syrup of hydrochlorophosphates, owing to the fact that all the available hydrogen chloride present forms part of the quinine salt, and it seems therefore to require a stretch of the imagination to find the "hydrochlorophosphates." A better and eminently more proper name would be a literal Latin equivalent of the official English title as expressed in the book, the synonym being dropped.

The "notes" under syrup of manna, compound syrup of morphine, and syrup of morphine sulphate should be omitted, as tending by useless verbiage to be confusing and misleading, aside from their being entirely unnecessary.

Syrupus Papaveris.—The note appended to this formula tells us that "the product is practically identical with the Syrupus Papaveris of the B. P. As the B. P. contains no formula for a syrup from Papaver Somniferrum, but one from Papaver Rhoeados, we might again think that the framers of the present N. F. went a little too fast, and in fact were exceptionally prolific in writing notes, many of which seemingly were written upon the slightest provocation. The note should be omitted.

Syrupus Pectoralis.—Title should be changed.

Syrupus Pini Strobi Compositus.—This is one of the best all-round formulas which have ever formed part of any formula book, and but for the timidity of some persons, could remain just as it is. Since the advent of the federal and state food-and-drug legislation, a great many persons are examining the label in order to determine just what they are taking, and some of them object to the morphine content in this syrup. Physicians are also demanding a preparation without morphine, and as the morphine content is very low, and thereby is of very doubtful therapeutic value, the writer suggests its omission.

Syrupus Quinidinæ is not an ideal preparation in that mucilage of acacia is prone to become sour and if used in that condition in this preparation, (which often will be done inadvertently) the bitterness of the alkaloid will be apparent. Saccharin has no place in this preparation, for there should be no bitter taste to mask, in fact there will be none if a good quality of granulated or powdered acacia be used instead of mucilage.

Syrupus Rhamni Catharticae. As the fermented juice of buckthorn berries is not obtainable in the average drug markets this formula is of

very little use and should be replaced with one made from the fluidextract of the berries, both the fermented juice and the fluidextract of the berries being very active hydragogue cathartics, the replacing of one with the other would produce an equally effective preparation.

Several additions should be made to the syrups, notable a cloudy compound syrup of hypophosphites, a chocolate syrup of quinine sulfate and a chocolate syrup of phenolphthalein.

Tinctura Amara: Another "practically identical preparation" is the above. If its origin or source is to be quoted it should be corrected to comply with that source. Really the note of reference should be omitted, and the unripe fruit of citrus vulgaris replaced by bitter orange peel U. S. P. which is easily obtainable, the reverse being true of the fresh fruit.

Tinctura Antiperiodica. "Under any name a rose would smell as sweet," so also would Warburg's tincture still retain its awful bitterness. For the sake of uniformity we must all use this formula and therefore one or two little questions arise that deserve the attention of the N. F. Committee; first, why the prepared chalk; second, why the opium (⅛ grain per fluidounce); and third, why "digest the powder in a glass flask provided with an upright condenser, on a water-bath, at a temperature not higher than 65° C. (150° F.), during twelve hours, carefully avoiding loss of alcohol by vaporization." It is just such processes as this which make the N. F. of more value to the manufacturing pharmacist than to the average retailer, and which has caused the writer to be compelled to listen to a dozen or more complaints from his ordinary, small establishment, and back-of-the-counter friends that the N. F. "is not practical," "is too technical," "has too many long and tedious processes" et cetera ad nauseam, all because some of our friends who were members of the last N. F. Committee were just a bit ahead of the ordinary man. There is no good reason why we should continue to digest this preparation on a water-bath for twelve hours and the committee would do well to require in the new edition that the processes of either percolation, or long-time maceration be resorted to, thereby simplifying the process, and reducing the cost (12 hours of gas, and no vaporized alcohol) to a profitable point. Everything can be said in favor of this formula, as it certainly produces a fine and thoroughly effective preparation, but one of its chief virtues is the absence of that relic of a hoary and dead past, confection of Damocrates, than which no more wonderful (?) and remarkable concoction ever existed.

Tinctura Aromatica.—The note should be omitted or the formula should be revised.

Tinctura Cresoli Saponata.—This preparation is so clearly allied to the official Liquor Cresolis Comp. that it would seem unnecessary.

Tinctura Ferri Chloridi Ætherea.—The "practically identical" note should be omitted, as this preparation is weaker than the corresponding

Ph. G. formula. The name is spelled wrong. It should be "Bestuscheff's."

Tinctura Ferri Pomata.—This preparation is not a tincture, but an aqueous solution, and should be defined as such even though it is official in the Ph. G. as a tincture. It is not practically identical with the "tincture" of that authority, for the reason that it has 10 per cent. of additional alcohol. The note should be dropped.

Tinctura Iodi Decolorata.—Much has been said pro and con concerning this formula, but after all is said and done, it seems to be a fairly good one, and its product in the writer's hands has given entire satisfaction. In connection with the iodine tincture of the N. F., a formula for compound tincture of iodine of the U. S. P. 1870 might be added, as there is still a well-recognized demand for it in some sections of the country.

Tinctura Pectoralis is another example of therapeutic titles and should be changed.

Tinctura Persionis.—This formula needs revision badly, inasmuch as percolation does not yield a preparation representing the maximum tinctorial power of the drug and is absolutely too tedious. Hankey (minutes Ohio Branch A. Ph. A., Dec. 20, 1907) suggests the following:

Cudbear, 12.5 Gm.; ammonia water (10 per cent.), 12.5 Cc.; water, 200 Cc. Macerate 36 hours, shaking at intervals; filter, wash the residue on filter with water until 200 Cc. of filtrate are obtained; evaporate filtrate to 50 Cc., add 33 Cc. of alcohol and, finally, sufficient water to make 100 Cc. Ammonia seems to bring out the coloring matter better than any other substance, and the writer has gotten exceptionally good results with this formula.

Tinctura Persionis Composita.—The drug in this formula should be replaced by an equivalent amount of tincture. This formula prescribes caramel. Just what is meant by caramel would be interesting, in view of the fact that the book provides no standard of strength for that substance, and also that it is an article of commerce and is extremely variable insofar as its coloring properties are concerned.

Tinctura Rhei Aquosa.—These "watery" tinctures of the German Pharmacopœia are a class all to themselves and it is just a little doubtful what to call them, according to the strict acceptance of the term. They cannot be defined as tinctures, but are more properly classed as mixtures. However that may be, this formula is not "practically identical," and as it is a very unstable product, so much so that the book includes an alternative formula, the part of wisdom would be to retain the alternative formula and discard the other. The same can also be said of Tinctura Rhei et Gentianæ.

Unguentum Calaminæ.—A standard of purity for calamine should form part of the book for the reason that it is a very hard matter to obtain a good quality of that substance.

Unguentum Camphoræ.—Should be dropped on account of its similarity to the pharmacopœial product.

Unguentum Resorcini Compositum.—The directions in this formula are all wrong; instead of triturating the resorcinol, zinc oxide, and bismuth subnitrate with a small quantity of the hydrous woolfat, the resorcinol should be dissolved in water 12 Cc., then triturated in a warm mortar with anhydrous woolfat 24 Gm., the zinc oxide and bismuth subnitrate being added in small portions triturating thoroughly till smooth, then the paraffin and petrolatum (which have previously been melted) added thereto, and lastly the oil of cade. The ointment can be made (according to Hankey) so that it will not darken, by replacing hydrous with anhydrous woolfat, and adding starch, using only 3 Cc. water with which to rub up the resorcinal.

Vinum Carnis et Ferri.—Much food for thought and reflection on this subject is given us in a very comprehensive paper entitled "Beef, Wine and Iron" by John Phillips Street, of the Connecticut Agricultural Experiment Station, (American Journal of Pharmacy, vol. 80, 355) in which he shows as a result of the analysis of 92 samples, that, "the procedure of the (National) Formulary results in a loss of 29 per cent. of the nitrogen, 35 per cent. of the ash, and 91 per cent. of the iron," and that "the substitution of citrate of iron and ammonia (sic) for the tincture of citro-chloride of iron, even when double filtration is practiced, prevents these losses almost entirely, besides furnishing a brighter and more attractive preparation." He further shows that fifty-five samples or 60 per cent. contain less than half the minimum standard of beef extract expressed as N, (0.13 Gm. of beef extract equaling 0.0122 Gm. nitrogen) and of iron, expressed as Fe, (0.128 Cc. of tincture citro-chloride of iron corresponding to 0.0058 Gm. of metallic iron). Surely we can sit up and take notice when we think what will happen when a food and drug inspector and government chemists get busy on a sample of beef, wine and iron bearing our guarantee.

Vinum Cocae Aromaticum, should be dropped owing to its close similarity to Vinum Cocæ U. S. P.

Vinum Pepsini.—The use of scale pepsin and the omission of alcohol tends to improve this preparation. Detannating the wine is also a still greater improvement.

Definition and descriptions of the several varieties of wines, required by the book, also their commercial names, and tests of purity and identity should be added.

Formulas for a wine of glycerophosphates and a compound wine of gaduol should be included.

Zinc Oleo-Stearas.—If this preparation possesses any advantages over Zinci Stearas U. S. P. it is not apparent, and as they are such close congeners, it would seem that it could be dispensed with.

In concluding this criticism the writer desires to reiterate his statement that he has looked at the National Formulary from the view-point of the busy pharmacist, and if he has been too severe, or if the cautery has been applied too deeply, he can only plead his love for a profession which should, if it does not always, stand for accuracy in all its different branches. It may be that unconsciously he has become in a small measure over-zealous and has scored where commendation should have been accorded. If such has been the case, his only defense will be that the error is one of omission, not of commission—*errare est humanum.* Our Pharmacopœia is a monument to the grandest minds in American pharmacy, both those who are still with us and those who, accepting the courtesies of the grim Ferryman, have crossed that impenetrable barrier which hides from us the beyond. While our European cousins cavil at us for our incessant worship of Mammon, they can no longer say that we are not a scientific people when they have such an object as our Pharmacopœia before them. The National Formulary is just as much a book of standards as is the Pharmacopœia, and we should not only ask of its Revision Committee the earnest effort to bring it up on a plane with the U. S. P., in so far as is possible without transcending practicability, but we should all do our utmost to keep it there by using it, consulting it, talking over its formulas and requirements with our medical friends, and even our customers when necessary.

An introspective view of the amount of work connected with the revision of either of these two books is certainly interesting, in view of the vast number of things which have to be done by the various sub-committees before we may have the pleasure of feasting both our eyes and our minds on the new volume. Really the labors of Sisyphus were as nothing in comparison.

A paper by William L. Scoville, of Detroit, upon detannating wine, was also received and referred to take the usual course.

DETANNATING WINE.

BY WILBUR L. SCOVILLE.

There are two reasons for desiring a wine free from tannin. First, to obtain a vehicle for alkaloids and alkaloidal drugs which will not precipitate the alkaloids as tannates, and second to prevent discoloration when such preparations are mixed with tincture of iron. The last result can best be accomplished by using the tincture of citrochloride of iron or by adding a soluable citrate. This prevents discoloration also with other substances than tannin which discolor in contact with iron solutions.

Of the methods which have been proposed for removing tannin from wines, gelatin has probably received the most attention. Success with this method depends upon using the gelatin in a fine powder—not an easy

procedure—and upon keeping the wine under 60° F. to prevent partial solution of the gelatin. Frequent shaking is also necessary. Under the best of conditions a wine may be deprived of its tannin sufficiently to be used as a vehicle for alkaloids, but such treated wine will usually discolor with iron. The time required is two days to two weeks, depending upon the fineness of the gelatine and the frequency of shaking.

The use of freshly-precipitated ferric hydroxide produces a wine which will neither precipitate alkaloids nor discolor with iron solutions, but the method is tedious and wasteful. The wine is diluted, and flavor and aroma are lost in the treatment. Unless the natural acids in the wine are neutralized before treatment the method is ineffective, and a wine so neutralized cannot be entirely restored to its original flavor.

The use of calcium hydroxide, which forms an insoluble compound with the tannins, is open to the same objection, and is certain to decompose some of the ethers in the flavor.

Violin strings and hide powder have been proposed. These are effective in proportion to the amount used and the shaking. Both are expensive.

Milk has been frequently recommended as a clarifying agent for medicated wines, but I do not find any record of its use as a detannating agent. In the course of a recent study of the detannating methods, milk proved to be not only the most convenient agent, but quite as effective as any. Since the milk proteids are the essential agents, a skimmed milk is quite as effective as a fresh milk.

It was found that with several varieties of white wines on which the process was tried, five fluidounces of milk per gallon of wine was needed. A port wine required eight ounces of milk per gallon. The absence of tannin in each case was ascertained by the absence of a precipitate with a strong solution of strychnine sulphate after twenty-four hours in an ice-chest.

The following process is recommended: To one gallon of white wine add five fluidounces of (skimmed) milk, shake well, and set aside for forty-eight hours, shaking once or twice during that time. Then filter off a small sample, mix it with an equal volume of two per cent. strychnine sulphate solution, and set in an ice-chest for twelve to twenty-four hours. If at the end of that time no precipitate is apparent in the test, the rest of the wine is ready for filtration. If a precipitate appears in the test, more milk must be added and the maceration repeated, usually one or two more ounces of milk being sufficient.

For red wines use eight ounces of milk per gallon at the start, and test in the same way.

The wines so treated must contain not less than eighteen per cent. of alcohol after filtering, and must be immediately fortified if below this strength.

The flavor and aroma of the wines are not materially affected, but the

color is made lighter. Darkening will occur if ferric chloride be added, but much less deeply than in the untreated wine.

No originality is claimed either for the process or the use of milk as a detannating agent, the purpose of this paper being simply to publish the author's experience in this line.

Mr. Wilbert abstracted a paper by E. Fullerton Cook, of Philadelphia, upon U. S. P. tinctures, the following being its full text:

TINCTURES OF THE U. S. PHARMACOPŒIA.

BY E. FULLERTON COOK, P. D.

The following paper is of the nature of a report upon the behavior of the U. S. P. tinctures when made from selected drugs, the official process being carefully and exactly followed, and when stored under the conditions of light and temperature most common to the average pharmacy.

These tinctures were made primarily for the purpose of providing the next Committee of Revision with authentic samples, whereby to judge the merit of the present official processes, but some proposals for changes in manipulation and formula are offered and experiments are now being conducted for the purpose of further correcting the difficulties reported.

As a class the tinctures are exceptionally satisfactory; the general process, that of percolation, where it can be applied, completely extracts the drug, so far as the menstruum is capable of dissolving extractive matter, if reasonable care and skill is used. The alcoholic and hydro-alcoholic menstrua produce preparations which are reasonably permanent, the exception, in most cases being, the separation of a slight precipitate. This precipitate, in the several tinctures, varies greatly in character and quantity, but, when separated and examined, it is in most cases inert and tasteless and may be accounted for by the well-known tendency of liquid preparations of vegetable drugs to gradually have some of their extractive matter oxidized or changed so as to become insoluble.

The details in each case are as follows:

Tincture of Aconite.—The process is satisfactory. A slight precipitate, which is readily mixed with the liquid on shaking, has formed. The preparation has stood about a year.

Tincture of Aloes and Tincture of Aloes and Myrrh.—It is desirable to state in the directions for both of these tinctures that the drugs be mixed, before introducing them into the bottle or flask for maceration. If the aloes alone be added to the menstruum, or the menstruum be poured upon the aloes, a sticky mass is formed, which clings to the sides of the container and enters solution with much difficulty. This trouble is avoided by mixing the aloes with the glycyrrhiza. Very little precipitation has occurred after standing for a year and the preparations are both approved.

Tincture of Arnica.—The maceration process, directed in the making of this tincture, seems to be both unnecessary and undesirable. The 1890 process, in which percolation was used, is clean, expeditious, and, in our experiments, produces a tincture, equal in every way, to that made by the maceration process of the U. S. P. (8th Rev.) In fact, unless there is a "tincture press" in the store, even in 1000 Cc. quantities, the present method is almost unworkable. It is very desirable, for this tincture, that the 1890 process, which had been official for at least 30 years, be restored.

Tincture of Asafetida.—The selection of drug of good quality is important. The process is satisfactory.

Tincture of Bitter Orange Peel.—The tincture, when first made, was slightly cloudy, and, after standing a year, the sample contains considerable precipitate of a brownish-green color.

Tincture of Sweet Orange Peel.—This is an excellent preparation of sweet orange peel and does not quickly lose its delicacy of flavor.

Tincture of Belladonna Leaves.—After 1000 Cc. percolate had been obtained additional menstruum was added, and, although the resulting percolate was highly colored, it was practically tasteless. This tincture, in common with most of the tinctures made from leaf drugs, soon developed a small quantity of a dark-colored, finely divided precipitate.

Tincture of Benzoin and Compound Tincture of Benzoin.—These tinctures are entirely satisfactory.

Tincture of Calendula.—The tincture when finished was quite cloudy, but after standing, the supernatant liquid is clear, and a small amount of rosin-like precipitate has firmly attached itself to the bottom of the bottle. Although this slight precipitate has formed, alcohol is doubtless the best menstruum for this drug. In the N. F. fluidextract of this drug where alcohol 2 parts, and water 1 part. is directed, as the menstruum, the container is soon half filled with a heavy precipitate.

Tincture of Columba.—Satisfactory, only a very slight precipitate.

Tincture of Indian Cannabis.—Entirely satisfactory.

Tincture of Cantharides.—Satisfactory; there is but a slight precipitate which is readily mixed aud forms a faintly cloudy tincture.

Tincture of Capsicum.—This tincture was slightly cloudy when first finished, but only a small amount of precipitate has formed on standing for a year. It is satisfactory.

Tincture of Cardamom.—The preparation was slightly cloudy when first finished, but only a light, easily mixed, precipitate has formed.

Compound Tincture of Cardamom.—The product is entirely satisfactory, but there seems to be no more reason for using whole drugs, and powdering them when the preparation is to be made, than in the simple tincture of cardamom. Without doubt in the majority of stores, powdered drugs are now used, for powdering in a mortar is not a popular operation

in this day, and, if a mill is used it is difficult to rid it of the aromatic odors.

If selected, whole drugs are not directed in all cases where oily, aromatic drugs are called for, there seems to be no good reason for an exception here.

Tincture of Cimicifuga.—A slight, readily mixed precipitate has formed on standing.

Tincture of Cinchona.—A brownish deposit has separated from the tincture. This precipitate has little taste, and tends to form in clotted masses. Similar deposits from cinchona have been examined and are said to be "cinchonic red," mixed with small quantities of the alkaloid.

Compound Tincture of Cinchona.—The precipitate is not so heavy as in the plain tincture of cinchona, but is of the same character.

Tincture of Cinnamon.—Entirely satisfactory.

Tincture of Colchicum Seed.—A slight, readily-shaken-up precipitate has formed.

Tincture of Digitalis.—A small amount of greenish-brown precipitate has formed as in the case of belladonna leaf.

Tincture of Nutgall.—This is one of the tinctures which can be made to advantage by maceration, and the U. S. P. percolation process should be so changed. If the powder is slightly finer than a No. 40, the menstruum will not penetrate the packed drug and no percolate can be obtained. If it is moistened before packing, it forms a pasty mass which cannot be properly packed. Maceration, however, seems to be satisfactory.

Compound Tincture of Gambir.—Entirely satisfactory.

Tincture of Gelsemium.—The product, when first finished, was slightly cloudy.

Compound Tincture of Gentian.—Here again the drugs should not be ordered in the unground condition, unless the principle is applied throughout all preparations. There is no advantage in freshly grinding the gentian, and the simple tinctures of both bitter orange peel and cardamom are prepared from "ground drugs." There is a slight precipitate in the finished tincture.

Tincture of Guaiac.—Entirely satisfactory.

Ammoniated Tincture of Guaiac.—When first finished the tincture was clear and apparently satisfactory, but upon standing for eight months it has developed masses of precipitate which about one-fourth fill the bottle.

Tincture of Hydrastis.—Slightly cloudy when first finished, and containing, after standing about a year, a slight precipitate.

Tincture of Hyoscyamus.—Satisfactory, but having a slight precipitate similar to that described under Tincture of Belladonna Leaves.

Tincture of Ipecac and Opium.—Not prepared to report.

Tincture of Kino.—Not prepared to report.

Tincture of Krameria.—Entirely satisfactory.

Tincture of Lactucarium.—Not prepared to report.

Tincture of Lavender.—Entirely satisfactory.

Tincture of Lemon Peel.—Very satisfactory as a flavor.

Tincture of Lobelia.—This tincture has precipitated as described under Tincture of Belladonna Leaves, but also contains a separation of an oily character, which clings to the bottle at the top of the liquid.

Tincture of Musk.—The finished preparation is entirely satisfactory, the only difficulty is in obtaining an authentic and active drug.

Tincture of Myrrh.—Entirely satisfactory.

Tincture of Nux Vomica.—This tincture has been largely criticized, due to the variation in the appearance of the finished preparation. Almost every sample of extract which is used will yield a differently colored tincture. It has been repeatedly suggested that it be made directly from the drug to secure a uniform appearance. The merit of the U. S. P. process lies in the ease with which uniformity in strength may be secured.

Tincture of Opium.—The product is satisfactory, although the propriety of introducing the alternative of preparing it from "gum opium" and afterwards assaying it, should be considered. It is doubtless made in this way on the large scale and permission is given, no doubt, in the general article or "Additional Notices, May 2, 1907" page lvii, of the U. S. P.

Tincture of Opium, Camphorated.—Entirely satisfactory.

Tincture of Opium, Deodorized.—Not prepared to report.

Tincture of Physostigma.—Entirely satisfactory.

Tincture of Pyrethrum.—Entirely satisfactory.

Tincture of Quassia.—The tincture, after standing for 9 months, has developed a small amount of precipitate which, on shaking the bottle, readily mixes with the liquid.

Tincture of Quillaja.—Considerable precipitate, of a dark brown color, has formed and separates into masses not easily shaken up with the liquid.

Tincture of Rhubarb.—Satisfactory as to product, but why powder the drugs when the preparation is made? (See comments on Tincture of Gentian).

Tincture of Rhubarb, Aromatic.—Entirely satisfactory, except for the powdering of the drugs.

Tincture of Sanguinaria.—Precipitation began in the percolate before the preparation was finished and the tincture contains a small amount, although not more than in many other tinctures. This precipitate has been noted before and the acetic acid has been added to prevent the separation of the sanguinarine.

Tincture of Squill.—A slight, flocculent precipitate has formed after standing 10 months, but the preparation is satisfactory.

Tincture of Serpentaria.—A very slight precipitate but a satisfactory preparation.

Tincture of Stramonium.—The same comment as under Tincture of Belladonna Leaves.

Tincture of Strophanthus.—Distinct drops of oil have separated on the top, and a slight resin-like precipitate is clinging to the bottom of the bottle. Various methods have been suggested for correcting this but none seem quite so satisfactory as the previous percolation of the drug with purified benzin. One other suggestion, the percolation of the drug with aqueous menstruum and afterwards adding the alcohol is worthy of careful consideration. The active principle, strophanthin, is very soluble in water.

Tincture of Tolu.—Entirely satisfactory.

Tincture of Valerian.—Very satisfactory.

Tincture of Valerian, Ammoniated.—The tincture has precipitated slightly, the latter being almost black in color and clinging closely to the bottom of the bottle.

Tincture of Vanilla.—Our experiments seem to indicate that this tincture is entirely satisfactory, although reports have come from other parts of the Country where much difficulty has been experienced from precipitation, when a tincture made in a warm laboratory has been shipped to a cold climate. The suggestion made by the "Flavor Houses" is, that a weaker alcohol be used and that in this way a finer flavor is developed. This suggestion should be considered but it may be an economic reason rather than one of flavor.

Tincture of Veratrum.—Entirely satisfactory, pharmaceutically.

Tincture of Ginger.—There was a slight precipitation of the oleoresin from the percolate, upon the sides of the glass contained. This precipitate could be transferred, only with difficulty, to the bottle.

The paper was received and referred to take the usual course.

A paper on syrups made from fluidextracts, by Messrs. Cook and Ebner, of Philadelphia, was presented in abstract by Mr. Wilbert, the text thereof being as follows:

SOME U. S. P. SYRUPS MADE FROM FLUIDEXTRACTS.

BY E. FULLERTON COOK, P. D., AND FRANK G. EBNER, P. D.

In the paper on "Syrups" of the U. S. P. (see A. Ph. A. Proc., 1908, p. 951) by E. F. Cook, four syrups especially were reported as being unsatisfactory pharmaceutically. They were the syrups of krameria, rubus, senega and senna, and all were made by mixing fluidextracts of the respective drugs with simple syrup, which resulted in an abundant precipitation.

In the process for syrup of ipecac, U. S. P. (8th Rev.) instead of ordering the mixing of fluidextract and syrup directly, the syrup is made by mixing the fluidextract with the proper amount of water, allowing this

mixture to stand for 24 hours, filtering, and dissolving the sugar in the clear filtrate.

The resulting syrup, from this process, is free from precipitation and remains so for at least more than a year, in the samples we have made.

The same general process has been tried with various modifications, on the unsatisfactory syrups and the following recommendations are made for their improvement. It is, of course, true that the mixing of some fluidextracts with water would cause a precipitation of all active ingredients, but it is believed that the syrups for which this process is recommended will in no way be injured by the adoption of the method proposed.

Syrup of Krameria.—The recommendation in a former paper (A. Ph. A. Proc., 1908, p. 960) to reduce the strength of this preparation from 450 Cc. of fluidextract to 250 Cc. of fluidextract in 1000 Cc. of syrup, thereby producing a preparation which, in the U. S. P. dose of one fluiddrachm will correspond with the U. S. P. dose for drug and fluidextract of krameria, has been tried and the change is again recommended.

Other experiments were conducted for the purpose of eliminating the objectionable precipitate which results from a direct admixture of fluidextract of krameria and syrup, as officially directed.

The fluidglycerate of krameria as suggested by Mr. Beringer (see Proc. A. Ph. A., 1908, p. 996 and A. J. P., 1909, p. 314) was tried, and, while the product was free from precipitation, in the strength of both 450 Cc. and 250 Cc. of fluidglycerate to the 1000 Cc. of finished product, yet the preparation was unstable inasmuch as extensive mould growths developed, at the temperature of the laboratory, within a few weeks. It might be that this preparation could be sterilized and moulds thus avoided, but the fact remains that conditions are here which permit the rapid growth of moulds if the spores are present or are introduced.

The following modified process is suggested:

Syrupus Krameriæ.—Syrup of krameria.

Fluidextract of krameria	250 Cc.
Sugar	635 Gm.
Water, a sufficient quantity, to make	1000 Cc.

Dilute the fluidextract of krameria with 350 Cc. of water, and mix them thoroughly by shaking; set the liquid aside in a cool place for twenty-four hours. Then filter and pass enough water through the filter to obtain 600 Cc. of filtrate.

Dissolve the sugar in this liquid by agitation and add enough water to make the product measure 1000 Cc. Mix thoroughly.

Syrup of krameria may also be prepared in the following manner:

Prepare a percolator or funnel in the manner described under Syrupus.

Pour the filtrate obtained as directed in the preceding formula, upon the sugar, return the first portions of the percolate, until it runs through

clear, and, when all the liquid has passed, follow it with water, until the product measures 1000 Cc. Mix thoroughly.

After standing for eight months this preparation has remained clear, being free from precipitate or moulds. The slight precipitate, resulting from the mixing of the fluidextract and water, was collected on a tared filter and weighed. The fluidextract had been recently made and was not "seasoned," thus making the test even more severe. From 25 Cc. of fluidextract used, 3.9 Gm. of precipitate was obtained, about 15 per cent. This precipitate was insoluble in water, ether and chloroform; partly soluble in boiling water and soluble in alcohol, diluted alcohol, and solution of sodium hydroxide. It gave no test for kramerio-tannic acid with ferric chloride.

It is asserted that all of the active principles of krameria are soluble in water, and as these active principles are of a tannin-like character, it is evident that nothing of value has been lost by this treatment. The preparation is astringent and dark in color.

Syrup of Rubus.—The syrup resulting from the U. S. P. (8th Rev.) process is very unsatisfactory, in that a heavy precipitate forms. The modification suggested below prevents this precipitation in the finished syrup, and a sample standing for eight months is perfectly clear.

Syrupus Rubi.—Syrup of Rubus:

Fluidextract of rubus	250 Cc.
Sugar	635 Gm.
Water, a sufficient quantity to make	1000 Cc.

Dilute the fluidextract of rubus with 350 Cc. of water and mix them thoroughly by shaking; set the liquid aside in a cool place for twenty-four hours. Then filter and pass enough water through the filter to obtain 600 Cc. of filtrate. Dissolve the sugar in this liquid, by agitation, and add enough water to make the product measure 1000 Cc. Mix thoroughly.

Syrup of Rubus may also be prepared in the following manner:

(See the percolation process suggested under Syrup of Krameria.)

When the fluidextract is mixed with the water a slight precipitation results, 25 Cc. of fluidextract producing 0.9 Gm. of precipitate, about 3.6 per cent. This precipitate was of a dark red color, practically tasteless, and seemed to be of a resin-like character. It was insoluble in water, ether, and chloroform, but soluble in alcohol, diluted alcohol, and solution of sodium hydroxide. The syrup made in this manner seemed to lose none of its astringency, so far as the taste indicated.

Syrup of Senega.—The well-known flocculent, upward, precipitation which forms in this preparation when made by the U. S. P. (8th Rev.) process, a separation which makes the syrup very unsightly, was not altogether prevented by the modification suggested in the cases of syrup of krameria and syrup of rubus. However, the addition of a small amount

of magnesium carbonate before filtering has proven satisfactory, and the resulting syrup, as made by the process suggested below, is clear, and has remained so for eight months. It is yet necessary to prove that the medicinal activity is not impaired by this treatment, but it is not at all likely that the small amount of weak alkali will be of any injury when the fluidextract already contains about three per cent. of solution of potassium hydroxide. The supposition is that the powder simply forms a better filtering medium, and while not tried it is likely that purified talc would be equally satisfactory.

Twenty Cc. of the fluidextract mixed with water (35 Cc.) produced 0.9 Gm. of precipitate, about 4.5 per cent. (the magnesium carbonate was not used for this experiment). This precipitate was yellow in color and formed a pectinous-like mass, insoluble in cold water, boiling water, alcohol and diluted alcohol; slightly soluble in ether and chloroform and freely soluble in solution of sodium hydroxide. As senega yields its active principles to an aqueous menstruum, it is not likely that the elimination of this precipitate injures the preparation.

Syrupus Senegæ.—Syrup of Senega:

Fluidextract of senega	200 Cc.
Magnesium carbonate	10 Gm.
Sugar	680 Gm.
Water, a sufficient quantity to make	1000 Cc.

Rub the fluidextract of senega, in a mortar, with the magnesium carbonate, add 360 Cc. of water and mix them thoroughly by shaking; set the mixture aside in a cool place for twenty-four hours. Then filter and pass enough water through the filter to obtain 560 Cc. of filtrate. Dissolve the sugar in this liquid, by agitation, and add enough water to make the product measure 1000 Cc. Mix thoroughly.

Syrup of senega may also be made in the following manner: (See percolation process as described under Syrup of Krameria.)

Syrup of Senna.—As made by the U. S. P. (8th Rev.) process, by the simple mixing of fluidextract and simple syrup, this preparation is unsightly, due chiefly to an upward precipitation which forms. This was not altogether prevented by the modification suggested in the first two syrups, but by the addition of a small amount of potassium carbonate a very satisfactory preparation results. A formula combining these suggestions is as follows:

Syrupus Sennæ.—Syrup of Senna:

Fluidextract of senna	250 Cc.
Oil of coriander	5 Cc.
Potassium carbonate	10 Gm.
Sugar	635 Gm.
Water, a sufficient quantity to make	1000 Cc.

Mix the oil of coriander with the fluidextract of senna; dilute this mixture with 360 Cc. of water, in which the potassium carbonate has previously dissolved; mix thoroughly by shaking, and set the liquid aside in a cool place for twenty-four hours. Then filter and pass enough water through the filter to obtain 620 Cc. of filtrate. Dissolve the sugar in this liquid, by agitation, and add enough water to make the product measure 1000 Cc. Mix thoroughly.

Syrup of Senna may also be prepared in the following manner:

(See the percolation process described under Syrup of Krameria in this paper.)

The precipitate resulting from the mixture of fluidextract and water, in the proportion here directed, from 25 Cc. of fluidextract weighed 0.67 Gm., about 2.7 per cent. It gave numerous indications of being only inert extractive.

The presence of potassium carbonate may be questioned, but in this connection some information collected by the Revision Committee of the U. S. P. will prove of interest. In the original report of the Sub-Committee on Syrups (see Revision Circulars, No. 256, p. 1052, U. S. P. 8th Rev.) the use of one per cent. of potassium carbonate was recommended in this syrup for the purpose of "diminishing the griping tendency." Whether such an addition would be desirable and unobjectionable from a therapeutic standpoint was reported upon by Dr. R. W. Wilcox (see Revision Circulars, U. S. P. 8th Rev., No. 272, p. 1120). He reported, with regard to the syrup containing one per cent. of potassium carbonate, comparing it with the syrup of senna of the U. S. P. 1890, that it "acts slightly quicker, gives fewer movements, and disturbs less."

The addition of the potassium carbonate was not finally recommended, however, because a fluidextract of senna, from which the griping principle had been removed, was introduced into the U. S. P., and as the addition of the potassium carbonate was for the purpose of eliminating this, there was supposed to be no need for it when the new fluidextract was used.

Our experiments have shown, however, that a small amount of potassium carbonate (1 per cent.) assists in producing a permanent solution, and as its presence is not objectionable, we would recommend its use.

The Chair called for discussion upon the subject of adding alkalies to syrups made from fluidextracts.

Mr. Wilbert stated that all of these fluidextracts were made of drugs that contained a considerable amount of what might be called inert extractive, and it is to prevent constant precipitation that this alkali is added. Whether or not the practice is permissible or advisable is a question.

Mr. Lloyd suggested that ammonia was once used as an addition to fluidextract of senega to preserve the polygalic acid, potassium hydroxide now being employed to prevent gelatinization.

Mr. Hemm, of St. Louis, added: "And with much better results."

The next paper called for was one by Mr. Beringer, stating the results of some further work he had conducted upon the fluidglycerates. The Chair called attention to some samples of these fluidglycerates that Mr. Beringer had sent for the inspection of the members—samples illustrating the results of his continued work along this line—stating that at the last meeting there were some of these experiments that had not proven satisfactory to Mr. Beringer, and he had promised to continue his work. Mr. Wilbert abstracted the paper, the following being its full text:

SOME FURTHER WORK ON FLUIDGLYCERATES.

BY GEORGE M. BERINGER.

In two previous papers * dealing with the subject of fluidglycerates, the writer has given an account of experiments on the extraction of various drugs with glycerol-water menstruums and the preparation of a number of concentrated liquids representing this proposed new class of galenicals.

The manufacture of a few of these fluidglycerates on a moderate scale has been attempted, and the practical use by physicians already indicates that such fluidglycerates as cascara sagrada, chirata, glycyrrhiza, krameria, sumac berries, and sarsaparilla are acceptable preparations, and further efforts will probably demonstrate that this list of useful remedies of this class may be greatly extended.

In a recent communication presented to the New Jersey Pharmaceutical Association,† the results of experiments made with the view of studying the application of the principle of glycerol-water extraction to the preparation of syrups are described. It was shown that quite a number of syrups can be thus prepared direct from the drugs without the use of fluidextracts or the introduction of any alcohol. Those for which improved formulas based on this method were presented and samples exhibited included syrups of ipecac, krameria, lactucarium, rhubarb, rose, rubus, compound sarsaparilla, compound squill, senega and licorice.

In the extensive paper on "Fluidglycerates" presented before this section last year, it was explained that the experiments so far made on the preparation of fluidglycerates of certain drugs were not satisfactory and further experimentation was intended. Among the refractory drugs so mentioned were nux vomica, red rose and sanguinaria. Experiments since carried on with these three have resulted in marked improvements. The purpose of the present paper is to communicate improved formulas for these and also to present the results of some experiments upon a few fluidglycerates of a different class of drugs that require for their extraction the use of an alkali in the menstruum.

* Proceedings N. J. Pharm. Asso'n, 1907, 56; Proceedings Amer. Pharm. Asso'n, 1908, 981.

† American Journal of Pharmacy, 1909, July, 311.

Fluidglycerate of Nux Vomica.—In the earlier experiments on this preparation, acetic acid was added to the menstruum to extract the alkaloids. The resulting product soon thickened and eventually became of a mucilaginous and almost gelatinous consistence. In recent experiments, the acetic acid was displaced by either hydrochloric, sulphuric or phosphoric acids. The preparation made with phosphoric acid has also thickened and become almost gelatinous, closely resembling that made with acetic acid; the product made with the addition of sulphuric acid has deposited a white precipitate closely adhering to the bottom of bottle. This sediment proved to be calcium sulphate, the calcium salt evidently present in the drug being extracted and deposited as sulphate. This sediment is readily removed by decanting the supernatant liquid which is bright, clear and deep in color and has kept quite limpid for nearly six months with no sign of any further deposit or thickening. It mixes perfectly clear with water, syrup or diluted alcohol, but strong alcohol renders it turbid. The average of two assays gave 1.002 strychnine in 100 Cc. The product made with the addition of hydrochloric acid is lighter in color than that containing sulphuric acid and has remained clear and limpid. It likewise mixes clear with water, syrup or diluted alcohol and becomes turbid with strong alcohol. The average of three assays was .996 strychnine in 100 Cc.

As a result of these experiments the following is submitted as an improved formula for fluidglycerate of nux vomica.

Take of Nux vomica in No. 20 powder	100 Gm.
Hydrochloric acid *	5 Cc.
Glycerin	50 Cc.
Water	145 Cc.
Chloroform water, a sufficient quantity.	

Mix the hydrochloric acid with the water and glycerin and moisten the drug with 85 Cc. of the mixture and pack it *lightly* in a percolator. Pour on sufficient of the menstruum to thoroughly saturate the drug and allow to macerate for 48 hours. Then percolate slowly using the balance of the menstruum and then chloroform water till extracted. Reserve the first 50 Cc. of the percolate, concentrate the remainder on a water-bath to 60 Cc. add the reserve and continue the evaporation till the product measures 100 Cc.

Fluidglycerate of Red Rose.—It was intimated in my previous paper that the addition of an acid to the menstruum would possibly improve this preparation. Sulphuric acid to fix the color of rose and to be specially indicated in the liquid preparation of that drug. The following is the improved formula for fluidglycerate of rose.

* If sulphuric acid is preferred, then use 4 Cc. of sulphuric acid in place of 5 Cc. of the hydrochloric acid directed in the formula.

Take of Red rose in No. 60 powder	100 Gm.
Diluted sulphuric acid	10 Cc.
Glycerin	50 Cc.
Distilled water	140 Cc.
Chloroform water, a sufficient quantity.	

Mix the acid, glycerin and water and having thoroughly mixed the rose with 300 Gm. of clean, pure white sand,* moisten it with 80 Cc. of this menstruum and transfer to a percolator, shaking down evenly but not packing. Pour on sufficient of the menstruum to saturate the drug and allow to macerate for 48 hours, then percolate slowly, using the remainder of the menstruum and then chloroform water till extracted. Reserve the first 50 Cc. of percolate and evaporate the remainder on the water-bath to 60 Cc., add the reserve and concentrate to 100 Cc. The product is a deep rich red color, clear, astringent and with a fine aroma and taste of rose. It mixes perfectly clear with water, syrup or diluted alcohol but is coagulated by alcohol. It would make a good basic preparation as it can be diluted for making a syrup, gargle or mouth wash where rose is desirable.

Fluidglycerate of Sanguinaria.—This is a difficult drug to extract and representing a concentrated liquid preparation that will be permanent and active. For some reason, acetic acid has been considered as particularly well adapted for its extractive and this is evidenced in the official fluidextract and in the formulas for the syrup and vinegar. Quite naturally the writer followed this idea in his experiments and in the formula submitted last year acetic acid was used; it was stated that the product was not satisfactory as it had developed considerable sediment and did not mix clear with water or syrup.

Subsequently experiments were made with varying proportions of acetic acid. Somewhat better results were obtained by increasing the acetic acid to 30 Cc. in 100 Cc. of product and using this mixed with 50 Cc. of glycerin and 120 Cc. water as the first menstruum. But even with this relatively large acid content the product soon became cloudy and deposited considerable sediment although its miscibility with other liquids was improved. It mixed clear with syrup and diluted alcohol and produced only an opalescence with water but with alcohol it became turbid.

Since acetic acid did not prove satisfactory my attention was directed to the use of hydrochloric acid. The experiments indicate that it has decided advantage over acetic acid for extracting this drug and suggest that its use in this connection should be investigated as it appears to offer an improvement in the formulas for the official preparations of the same.

* For this purpose sand free from iron is necessary and the purest commercial white sand obtainable was boiled with diluted hydrochloric acid and then washed by decantation and finally on a strainer till the wash water ceased to give a precipitate with silver nitrate T. S.

The following is the improved formula for fluidglycerate of sanguinaria :

Take of Sanguinaria in No. 20 powder	100 Gm.
Hydrochloric acid	10 Cc.
Glycerin	50 Cc.
Water	140 Cc.
Chloroform water, a sufficient quantity.	

Mix the acid, glycerin and water, and moisten the drug with 50 Cc. of the mixture, transfer to a percolator and shake down evenly, *without packing*, and pour on sufficient of the menstruum to saturate, and allow to macerate for 48 hours. Then percolate slowly, using the remainder of the menstruum, and then chloroform water till extracted. Reserve the first 50 Cc. of the percolate and evaporate the remainder to 60 Cc., add the reserve and concentrate to 100 Cc.

This product is clear, dark red in color, and after standing three months has shown no tendency to precipitation. It mixes clear with syrup, diluted alcohol and alcohol, and with water produces a slight opalescence. It possesses the bitter, acrid and irritating taste of the drug, and the smallest amount tasted produced the disagreeable irritating effect on the mucous surfaces. The physical characteristics of the fluidglycerate so made appear to fully represent the drug, and the marc is free from acridity and is deprived of the red color.

ALKALINE FLUIDGLYCERATES.

There are a number of drugs that require the presence of an alkali for their proper extraction. In the previous paper three fluidglycerates of this class of drugs were considered, namely, fluidglycerates of glycyrrhiza, senega and the bitterless fluidglycerate of cascara sagrada. Three more of this class have been investigated since, viz., buchu, eriodictyon and grindelia, and formulas for these are here given.

Fluidglycerate of Buchu.—

Take of Buchu in No. 20 powder	100 Gm.
Solution of potassium hydroxide	50 Cc.
Glycerin	50 Cc.
Water	100 Cc
Chloroform water, a sufficient quantity.	

Mix the solution of potassium hydroxide, glycerin and water, and moisten the drug with 100 Cc. of this menstruum. Transfer to a percolator and shake down evenly, then pour on sufficient of the menstruum to thoroughly saturate. Allow to macerate for 48 hours, and then percolate slowly, using the remainder of the menstruum, and then chloroform water till extracted. Reserve the first 50 Cc. of the percolate and evaporate the remainder on a water bath to 60 Cc., add the reserve and concentrate to 100 Cc. This product is a thick, almost mucilaginous fluid that has deposited no sediment. It possesses the odor and taste of the drug. It

mixes clear with syrup and diluted alcohol, and opalescent with water, and is coagulated by alcohol.

Fluidglycerate of Eriodictyon.—

Take of Eriodictyon in No. 20 powder	100 Gm.
Solution of sodium hydroxide	50 Cc.
Glycerin	50 Cc.
Water	100 Cc,
Chloroform water, a sufficient quantity.	

Mix the solution of sodium hydroxide, glycerin and water, and moisten the yerba santa with 80 Cc. of the mixture. Proceed to extract and finish as directed in the formula for fluidglycerate of buchu. The resulting preparation has the color, taste and odor of yerba santa, and has developed only a scant sediment. It mixes clear with syrup and diluted alcohol and with water produces only a slight opalescence, but with alcohol a turbid mixture results.

In this preparation sodium hydroxide has been selected because its principal use will be as a disguise for quinine sulphate and other bitter alkaloids and drugs and sodium sulphate resulting in such mixtures is less apt to crystallize out than if potassium hydroxide was used with potassium sulphate as a resultant. It will serve as a basic preparation for syrup of yerba santa and for admixture with chocolate syrup and similar flavorings and diluents.

Fluidglycerate of Grindelia.—

Take of Grindelia in No. 20 powder	100 Gm.
Solution of potassium hydroxide	50 Cc.
Glycerin	50 Cc.
Water	100 Cc.
Chloroform water, a sufficient quantity.	

Proceed exactly as directed in the formula for fluidglycerate of buchu. The product is a clear, deep brown colored liquid possessing strongly the odor and taste of grindelia and showing no precipitate. It mixes clear with water, syrup, diluted alcohol, and cloudy with alcohol.

There is already considerable demand for the so-called "aqueous" or "soluble" fluidextract of grindelia as a topical application in rhus poisoning, and this alkaline fluidglycerate will doubtless prove equally as effective for this purpose.

Discussion was invited, and Mr. Osseward, of Seattle, said he would like to say that, after the meeting at Hot Springs last year, he had started in to make a few of the principal fluidglycerates, but found, as Mr. Beringer had suggested, that the physicians did not seem to use fluidextracts very much. He found a few that had been used in his city quite extensively, such as krameria and one or two others. Digitalis had also

been tried, but he had not found good results, and while one physician used it, he had not had very encouraging results from that. Those he had referred to he had kept making right along, because there were calls for them.

Mr. Wilbert called attention to a paper published in the "American Journal of Pharmacy" during the past year, which involved some pharmacological work in connection with fluidglycerate of digitalis. Referring to the suggestion in the paper of Mr. Beringer concerning fluidglycerate of coffee, he said that syrup of coffee as found in the National Formulary was very unstable. Coffee has many uses as a flavor in connection with prescription work, and it would appear that the fluidglycerate of coffee offered a field for usefulness. Coffee to many people has an agreeable flavor. It is not objectionable, its medicinal properties are not marked, and it is subject to exploitation to a considerable extent as a vehicle for medicine. Mr. Wilbert said he believed it offered an excellent field for the retail pharmacist to develop, and, in his judgment, was quite a practicable proposition. To give the physician a new and desirable vehicle was quite an advantage. The subject offered a wide field for experimentation, and any retail pharmacist could do something along that line.

Mr. Osseward said he had one physician who used the flavor of coffee with concentrated solution of magnesium sulphate. Some people do object to it, however.

Mr. Seltzer said he had made a nice preparation in that way—that he used himself.

The next paper called for was one by W. R. White, of Nashville, upon the uses of chocolate and cacao in pharmacy. Mr. White presented his subject as follows:

COCOA AND CHOCOLATE AND THEIR USES IN PHARMACY.

BY W. R. WHITE, NASHVILLE, TENN.

Having noticed the increasing popularity of chocolate and cocoa as used in dietetic and food products, such as confectionery, pastries, soda waters, ice creams, and as an infused beverage, also the recent introduction to the trade of several medicinal chocolate preparations, I have consented to read this paper, more with a view of opening up this subject for discussion than with any idea of attempting to bring out any new discoveries along this line.

There seems to exist a great deal of confusion in regard to the meaning of the words, cocoa, cacao, and chocolate. Cocoa, which is the English form of the Spanish word cacao, is often erroneously supposed to be a product of the cocoanut palm or of the coca leaf, but in reality, is a product obtained from the bean of theobroma cacao. Chocolate, from the aboriginal aztec word choco (a drink) is frequently used as a synonym of cocoa, but according to the definition given it by the Department of

Agriculture, it is the solid or plastic mass obtained by grinding cocoa nibs, without the removal of fat or other constituents, except the germ, and contains not more than 3 per cent. ash insoluble in water, 3½ of crude fiber, and 9 per cent. starch, and not less than 45 per cent. cocoa fat, while cocoa is defined by the same authority as cocoa nibs with or without the germ, deprived of a portion of its fat and finely pulverized, and contains no higher percentage of ash, fiber or starch than is found in the sugar and fat-free residue of chocolate. The principal difference is in the amount of oil of theobroma each contains.

Cocoa nibs are defined as the roasted broken beans, freed from their shells or husks.

Chocolate liquor is a very black and bitter variety of chocolate and is extensively used in the confectionery trade, being sweetened with sugar and used as a coating for candies. The consumption of chocolate is greatly increasing and the popular taste is being educated faster than production. The annual consumption is stated to be 100,000,000 lbs.

Cocoa is very nutritious and $\frac{9}{10}$ of it is said to be assimilated in the system. Linneus was so fond of it that he attached the name theobroma to cacao, meaning a food fit for the gods. In order to fully understand some of its uses, we must look at the composition of chocolate, which is given as

Fat 50 per cent., albuminous substances 14 to 18 per cent., starch 9 to 15 per cent., theobromine 1½ to 4 per cent., and red coloring, a trace.

The fat when separated and purified, is known as the cocoa butter of the market. Its use as a bland, easily-melted base in making suppositories, face massages, etc., is well known to each of you.

Theobromine, the main therapeutic agent, is very similar to caffeine, and can be converted into it by replacing one of its atoms of hydrogen with the methyl group.

Diuretin is a combination of sodium theobromine and sodium salicylate, and is well-known for its diuretic action.

Uropherin is a corresponding lithium theobromine salicylate.

One of the first uses of chocolate in pharmacy was as a coating for pills to disguise their nauseous taste. Then followed the line of chocolate-coated tablets which have become so popular.

Tablet triturates made with a base of chocolate and sugar, have been used as a vehicle for disguising the taste of such substances as calomel and santonin, aloin, podophyllin, croton oil, etc.

Then there is the medicated chocolate drop, which has proven an especially good means of administering many nauseous drugs to children. Powdered cocoa mixed with sugar I have found to be excellent for giving a pleasant taste to headache powders. I have made some experiments along this line by using equal parts of Baker's powdered cocoa and powdered sugar, and trying its effect on the taste of various drugs, and herewith give some of my results:

By mixing—

Three grains powder with one grain sodium salicyl., got no taste of sodium.

Five grains powder with one grain sodium salicyl., decided chocolate taste.

Two grains powder with one grain powd. acetanilid, a slight burning taste.

Four grains powder with one grain powd. acetanilid, plain chocolate taste.

Three grains powder with one grain aspirin, chocolate taste followed by an acid taste.

Five grains powder with one grain aspirin, pleasant chocolate taste, only slightly acid.

Nine grains powder with one grain citrated caffein, leaves somewhat acid taste.

Two grains powder with one grain santonin, leaves pleasant, sweet chocolate taste.

Two grains powder with one grain calomel and soda, chocolate taste plain, scarcely any taste of soda.

Two grains powder with one-fourth grain morph. sulph., disguises bitter very much.

Four grains powder with one-half grain opium, overcomes much of the disagreeable odor of opium and improves taste.

Four grains powder with one-half grain each opium and ipecac, overcomes much of the disagreeable odor of opium and improves taste.

Three grains powder with one grain sodium bromide, reduces intensely salty taste and leaves chocolate taste.

One grain powder with one grain salol, gives a pleasant aromatic taste instead of faintly sweetish.

In my opinion a powder of this kind would make a good vehicle to keep made up and use similarly to aromatic powder.

Perhaps the greatest efforts recently made to use chocolate in pharmacy have been to combine it with medicinal agents in a liquid form. This has been successfully accomplished by several manufacturers with emulsion of codliver oil, syrup of quinine and a syrup of phenolphthalein. The greatest difficulties met with here are found in the fact that cocoa is not completely soluble in any of the common solvents, and must be dispensed in a suspended state by thick mucilages or syrups, and also in the fact that aqueous mixtures of cocoa ferment so easily. I have found that 10 per cent. glycerin will not preserve an aqueous mixture, also that lime water alone will not keep it. The nauseous taste and smell of codliver oil have caused me to try the effects of cocoa when added to the emulsion. Out of eighteen different emulsions made with varying proportions of powd. acacia, and powdered acacia and powdered tragacanth mixed I have selected the following formula as the most satisfactory, having kept well for two months and not showing any signs of separation:

Oil peppermint	2 minims.
Cod-liver oil	1 ounce.
Powdered acacia	3 drams.
Powdered cocoa	2 drams.
Alcohol	96 minims.
Saccharin	½ grain.
Lime water, sufficient to make	2 ounces.

Directions.—Dissolve the cocoa in the lime water by heating 10 minutes,

cool, and make mucilage by adding 2 drams of this solution to the acacia, then adding oil in small portions, triturating briskly until emulsified, then add remainder of cocoa solution and alcohol, in which oil of peppermint and saccharin are dissolved. This made a very thick solution, which pours slowly. By reducing the amount of acacia the proper consistency can be gotten. Cocoa improves an emulsion of castor oil, and the following proved very satisfactory to me :

Castor oil	2 ounces.
Powdered acacia	6 drams.
Oil peppermint	3 minims.
Powdered tragacanth	16 grains.
Saccharin	4 grains.
Glycerin	192 minims.
Cocoa	2 drams.
Distilled water, sufficient to make	4 ounces.

A solution of the cocoa in the glycerin and water was made by boiling five minutes. A mucilage of the acacia and tragacanth was made with 4 drams of the solution of cocoa and the oils gradually incorporated by trituration until emulsified, then the remainder of the coca solution added.

By adding half a dram of powdered cocoa to each ounce of a 50 per cent. emulsion of petroleum oil and the same amount to an ounce of the N. F. stronger emulsion of turpentine, an improvement was noted in taste.

Syrup of quinine sulphate with cocoa is a combination with which I have made repeated experiments. I found by combining two drams of powdered cocoa with an ounce of aromatic syrup of yerba santa which contained 16 grains of quinine sulphate I could get a preparation which was almost bitterless, although a slightly bitter taste would finally develop in the mouth, which, so far, I have been unable to overcome.

Cocoa added to sweetened combinations of balsam of copaiba and oil of sandalwood improves the taste a great deal.

Basing my conclusions upon the results I have obtained by experimentation, it is my firm conviction that when this subject is more fully investigated, cocoa will hold a very important place in the field of pharmacy.

The Chair said he was glad to receive a paper from this writer, and the paper was on a timely subject, and showed a great deal of care in preparation. He invited discussion on the paper.

Mr. Theodore L. Scheips, of Chicago, said he had experimented a little with syrup of chocolate, and he had found it to resemble a similar proprietary preparation on the market by the use of three-fourths of an ounce of selected tragacanth, which made a very heavy, viscid, ropy syrup, and yet at the same time a mobile syrup. He had also found it to be a preparation that kept well. The ordinary syrup of chocolate will precipitate in a very short time, and it makes a precipitate that is very hard to get back

into suspension. But by using three-quarters of an ounce of tragacanth it makes a very nice preparation.

Mr. Searby, referring to the statement of Mr. White that he had not been entirely able to overcome the bitter taste of quinine sulphate, suggested that if he had used the alkaloidal quinine instead of quinine sulphate, which is more or less insoluble in water, it would have aided very much in making a bitterless syrup.

Mr. Scheips added that syrup of chocolate was subject to fermentation, and that the manufacturers added a small amount of salicylic acid to the syrup. This is used as a preservative and to promote the secretions. That is the claim they make.

Mr. Schmidt, of San Francisco, said he had been accustomed to making a syrup of chocolate by simply taking the ground cocoa as found on the market, and boiling it for fifteen minutes with a certain quantity of water, then adding a pound and a half avoirdupois of sugar, and boiling it a few minutes longer until the sugar is dissolved, and then adding from three to five per cent. of alcohol, shaking thoroughly. That syrup he had found would keep for months and months, even in hot weather. He always keeps it ready made and never has any trouble. It makes a very heavy syrup, and just pours out of the bottle, that is all; but it is permanent—at least it keeps for months at a time.

The Chair called on Mr. John Uri Lloyd for his paper on the program, entitled "Concerning Some Pharmaceutical Problems." Mr. Lloyd explained that when he came to the meeting he found he was down for a paper, but he had none prepared, and had written one after reaching the meeting; therefore the paper he intended to present would bear some revision. He said the subject of it was one that was very dear to him, and from what he knew of pharmacy and its struggles was probably dear to other pharmacists. He explained that the title of the paper was not that given in the program, but "The Debt We Owe to Empiricism." He then read his paper, and received the applause of the members. The text of the paper here follows:

THE DEBT WE OWE TO EMPIRICISM.*

Wheresoever we may turn, whether it be to any section of art, science, or the professions, we find a backward path which leads into the field of so-called empiricism. If next our glance be turned onward, in the covered future will be perceived possibilities, some shadowed, others nearly hidden, that the person known under the term empiricist only can discover. Too prone are we to laud the man who makes the final, or even a passing touch, in a chain of events in which we view only the end re-

* A paper on this subject was read at the meeting of the Cincinnati Literary Club, spring of 1904, by the author, and was so kindly received as to lead him to presume that some of its features exemplified may again be useful.

action. Not often do we stop in our eulogies of modern science and art to credit those whose wanderings in days gone by have made possible the brilliant achievements of that science and art now in the strength of its youth.

Listen, man of science, listen to the words of wisdom spoken once, but yet lastingly and forever, to all mankind. "Remember now thy Creator in the days of thy youth."

Then, as a momentary offering in behalf of men whose efforts to benefit humanity are bearing us golden blessings, but who in name have been severally and forever lost to history's page, the speaker presumes to ask his hearers to briefly consider the general debt we owe to the empiricists of the past.

Among the earliest remedial agents, as well as the most useful remedies of the present, are plant products and plant educts. From the dawn of the study of medicine to the threshold of the nineteenth century the most conspicuous of all remedies, as well as foods, have been those formulated under the influence of vegetable life. The "simples" of the aborigines of all climes and lands, the remedies of domestic medicine, as well as those of so-called empiricists past and present, the agents that science most values and most studies, have been, and yet are, plant structures.

The one great bank of wealth that conserves life is the green bank of vegetation that encircles the globe.

On this every country of the globe depends. Every people of the earth partakes thereof. The Pharmacopœia of every country, the materia medica of all the schools in medicine past and present, give their best care to the remedial action of vegetable structures. The established, the cherished remedies have they ever been of all nations. No more are they to be displaced by any artificial substitute than are vegetable foods to be replaced by synthetic evolved by the chemist. To annihilate vegetation would be to bankrupt animal life, to make a barren desert of the land, a deserted expanse of the mighty deep.

Let us not, however, neglect to credit inorganics for their part in life conservation. No man will deny the value of minute amounts of sodium and potassium compounds, of chlorine and other salts, of earths, of minerals in foods. Indeed this writer believes that in their natural settings they are much underrated. Nor will a person, if he thinks, undervalue the inorganics in vegetable medicines, where either alone, or as integral parts of plant structures they do well their part. Here too this writer believes there has been much neglect of important functions that the inorganics play in plant structures, as well as in life processes of vegetation. But as no reflecting man will presume to restrict his foods wholly to the inorganic parts of organized vegetable substances, so no balanced mind, informed concerning the records of the remedial agents of the past, or their qualities as known at present, will deny the supremacy of vegetable

structures as food products or as corrective agents, in the hands of men qualified to use them intelligently.

Out of the earth and the sunshine come the life and structure of all that lives. Out of light and heat come the forces that bind dead earth and water into organized individuality.

The life of man, and the health of man, depend on the continual utilization of the conserved energy held in the life forces that are locked in vegetable structures, be they called foods or remedies.* In this direction little has yet been accomplished. Possibilities that lie before or about us in this mighty maze of living vegetation, untouched by man are but dimly comprehended by the most enthusiastic optimist.

But the qualities of unknowns are only to be determined, be they for good or evil, by experimentation. No publication advised primitive man concerning the good or the bad of things about him. Few of us have ever given a modicum of thought to that which as a world-known food at present came to us much as a silver spoon comes to the hand of a child. Lost in the past are the experiments that led man to know that wheat is a food, and the same is true of most fruits. The wanderings which gave us most of our known foods, as well as our vegetables and medicines, are not less tortuous than is the painful creeping of the human family from savagery to so-called civilization. Nor are they less obscure than is an impenetrable problem, because this journey of the standard food down the ages commenced before man presumed to record any data whatever. The story of the primitive foods antedates the records of civilization, coming down to us much after the manner in which a robin teaches its young to eat a worm. Nor has the upward struggle been uneventful even though the record is lost.

Who can tell the number of lives sacrificed in the experimentation that finally led to the separation of the volatile poison that exists in the tapioca plant from the wholesome starch food known as tapioca? Who knows the number of deaths preliminary to man's differentiating between the poisonous and the edible fungi, which subject is yet a problem, for in this field deaths even now often occur. Nor did instinct teach humanity to differentiate between the poisonous berry and those edible. The story of how the starches of some of the acrid arums came to be utilized by primitive people so as by manipulation to become foods, or of the discovery of the distinction between edible fish and flesh, and the forms of flesh and fish unwholesome, is as obscure as the experiments that ages ago led to the utilization of selected parts of innocuous weeds as foods. Somewhere in

* Do not infer that the author overlooks or condemns *animal* foods. This paper will not permit a consideration of that phase of the subject, but it may be said briefly that the use of animal food is but the utilizing of vital force that has been transferred to flesh, from plants that the animal has eaten. Plant life is the great food store-house of both carnivorous and herbivorous animals.

nature's climes all food plants are, or probably have been, weeds. To find out and then establish their values as nutrients demanded experiment, in which some were found to be useful, after which they became known as foods. This research is yet part of man's evolution, and must be largely empirical. But to the pioneer death is no stranger.

So recent, comparatively, is the sad proving of the attempt to eat as a pot-herb one of America's then new plants as to have fixed the term "*Jamestown weed*" to the herb which the settlers of Virginia about Jamestown investigated to their sorrow and death. Food is man's chief necessity, and man's search for food is a story still in progress. There is yet a risk in some directions, where persons uninformed partake of products that to others are known by the instruction of experience to be poisons. In England the "sowbread," or bryonia, claims each year its victims. The same is true of Oenanthe crocata. The wild parsnip is often eaten in America for parsnip, and death results. The terribly poisonous amanita is repeatedly mistaken for the wholesome mushroom. Whole families sometimes perish; no antidote is known. This year, to the writer's knowledge, two children perished in one of our southern states by eating the root of poison hemlock, the plant with a record, made conspicuous by Socrates' death. The Calabar bean, known to the African aborigines as the fearful ordeal bean, was fatally eaten by children in London. Experimentation thus recently taught in civilization's greatest metropolis a fact known from untold time to the most primitive man.

And yet, the weeds of the fields, the plants of the desert and the forest, unquestionably still offer untold food opportunities to the human family. Wise is the man who can predict what experimentation and cultivation based on empiricism may yet develop in unseen directions.

Let us not forget that the luscious apple is said to have been derived from a knotty, astringent wild fruit; that the mother of the potato grows yet as an insignificant wild tuber in Mexico and South America. But a generation back the tomato was considered poisonous, was cultivated merely as an ornamental plant, and, in the memory of persons yet living, was eaten *green* instead of ripe.

Turn now more directly to remedial plants. Who can even formulate the empirical wanderings that led to the discovery of the qualities of such as ipecac, nux vomica, opium, jalap, podophyllum, that are possessed of energies that may, if illogically used, make them poisons, or if discreetly employed, yield kindly remedial agents? Who can trace the more difficult study that led to the discovery of the insidious, but not less valuable, qualities of less harsh agents, such as Baptisia, Aletris, Hydrastis, Collinsonia, Macrotys, and that last remedial introduction, Echinacea, which but a few years ago was known only as a worthless Western weed? What will next serve humanity in this field? Who can predict the name of the plant next to unfold its remedial qualities? Who can tell what lies concealed in the humblest weed at our feet?

Listen. Comes now a reflection over the debt we owe empiricism. Practically all foods and drugs that have been thus introduced are empirical gifts to man, in the sense that these natural upbuilding or corrective agents have been established experimentally in time lost to science records. The good of those unknown but yet to come must as surely be the result of experimentation.

Nature's gifts that nourish and conserve life, that upbuild tissue, modify the life current or prevent the abnormal destruction of tissue, with few, if any, exceptions, have been the result of empiricism. From out the past have been handed to mankind of the present by primitive man the choicest of Nature's blessings. Their beginnings have been in experimentation, which, in the past, was part of a struggle for existence wherein no book record is preserved. The data of it all are lost.

SCIENCE AND EMPIRICISM LEAN ONE UPON THE OTHER.

The scientific astronomer calculates to a second a coming eclipse, but he does this by the data empirical observers of the past have separately recorded. His observed results of seemingly disconnected phenomena will in turn serve for scientific calculations in perhaps the far distant future. Thus, even in astronomy empiricism and science lean upon one another—thus the one conserves the other, thus each becomes a part of the other. And thus, too, the man of science of to-day *in our field* becomes the empiricist of him destined to look back from out the morrow. Behooves it not, then, that we, one and all, think twice, and yet again, when comes the questioning of these mighty problems? Behooves it not that we balance our thought and weigh well our words lest the debt we owe empiricism be underrated?

The Chairman said he was sure the members of the Section had enjoyed Mr. Lloyd's paper very much. He presumed there would be no comments on it, and it would take the usual course.

Mr. Hallberg said he for one did not propose to let this splendid paper pass by unnoticed in this way. "If it meant anything, it meant there were certain valuable things in this world, even if they could not be appreciably seen or tabulated, or have molecular form attached to them. At the present time, and for a year past, a number of eminent members of this Association desired, and have desired, to sweep out the "rubbish" of the Pharmacopœia and also of the National Formulary. They desired to purge the Pharmacopœia of what they called poly-pharmacal preparations, such as paregoric, Huxham's tincture and compound cathartic pills which had been referred to by the President in his address as characteristic of the middle ages. These people say that they want only substances that can be clearly defined, and whose action can be estimated in some mathematical way—some way that a scientific man can use it. Mr. Lloyd had well pointed out the debt we owe to empiricism, and Mr. Hall-

berg thought that if the highest ambition of these purists and *simplicists* should be attained in the future, we would find after all that empirical methods could not be ignored. "The human body is not an automobile," said Mr. Hallberg. "It is not a dirigible balloon." There is nothing made by man, and he did not believe there ever would be, that represented "such a wonderful complex differentiated concourse of atoms" as the human body; "and," said Mr. Hallberg, "when any man thinks that he can correct an abnormal condition in one body by the same method that he succeeds in correcting it in another body, he may possibly succeed, but the chances are that he will miss it"—simply because of the fact so indelibly impressed upon his mind some ten years ago, at the first hearing on the Pure Food and Drugs law in Chicago, by the general committee of the House and Senate, when the use of preservatives in food was brought up, at which time Dr. Albert B. Prescott, in his time the greatest chemist in America—"and one of our most dearly beloved and most prominent members"—in response to the question of whether preservatives would be proper, said (and this applies to medicine, of course, as well as to the use of foods): "There are no more two human stomachs exactly alike than there are two human faces exactly alike." And there is the ethical side of this complex question also. We must be very careful, and we must remind these purists that where we have remedies handed down to us from Damocrates and on down even through Paracelsus with one hundred and seven ingredients, and been brought down now to two or three potent ingredients, we must remember there are such things as the little substances that add to these indefinable effects of drugs on the human body, and that often accomplish the very result that we desire. Continuing, Mr. Hallberg said he was very glad indeed to have listened to this excellent paper of Mr. Lloyd's, because it was timely, and because he for one was opposed to cutting out from the Pharmacopœia and National Formulary these old-time remedies that have been, and are being, used by the people that use medicine. "We don't care for the people that don't use medicine," said Mr. Hallberg.

The Chair stated that the Section had before it two or three papers by Mr. Raubenheimer, of Brooklyn, of which he thought it would be desirable to have a short *résumé* by Mr. Wilbert while he was still present with the Section.

Mr. Wilbert said he thought it extremely unfortunate that the several papers by Mr. Raubenheimer were not in print, for no matter what distance a member had come, whether a thousand or three thousand miles, they were worth making his trip to hear. The one on Magma Bismuthi alone would repay him many times over for the trip, and when he got home he would experiment with the formula and try out the process. He said the author, in his inimitable style, had gone to the bottom of things, and had given the history of bismuth preparation, its uses and applica-

bility in its various forms. Mr. Wilbert then proceeded to abstract the paper, the following being its full text:

MAGMA BISMUTHI.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

It was my original intention to give in this paper the complete history of bismuth. But my notes on this subject, together with the valuable information which Hermann Schelenz, the German historian and author of the great work "Geschichte der Pharmazie," was kind enough to communicate to me, are so voluminous that I concluded to embody them in a separate paper on "*The History of Bismuth*" at some future time. However, I will mention the following historical data: Bismuth under the name of "Marcasita," which also indicated a mixture of metals, has been known to the ancients, but not so distinctly as lead, tin, zinc or antimony, with which metals it was too often confused. Credit is certainly due to the celebrated French pharmacist Nicolas Lémery for publishing, 1681, in his book "Cours de Chimie" a formula for the preparation of Magisterium Bismuthi, which under the name of blanc de bismuth, blanc de fard and blanc de perle, was, and is, even to-day, used as a cosmetic.

Credit is furthermore due to Dr. Louis O. Odier, the celebrated Genéva physician, for bringing bismuthum subnitricum into the materia medica, because he *was the first* to advise and use this preparation as an internal remedy in 1785.

Bismuth subnitrate is the oldest known salt of this metal having been described, as before said, in 1681 by Lémery, and also, as "Magisterium Marcasitæ" in 1608 by the celebrated French chemist Jean Béguin in his "Tyrocinium Chymicum," and very likely was also known to the great physician-pharmacist and founder of iatro-chemistry (medical chemistry) Paracelsus in the 16th century. Although *bismuth subnitrate* is even to-day used more than any other bismuth preparation, it has *certain disadvantages*. I have, for a number of years, collected data on this subject, which will prove the disadvantage of this salt and also that such preparations as "bismuth hydroxide" and "magma bismuthi" are absolutely necessary in modern pharmacy and medicine.

Already Odier, who, as stated before, advocated the internal administration of bismuth subnitrate, noticed nausea after its use, and Werneck noticed vomiting, colicky pains and in several cases diarrhœa, while in others there occurred obstinate constipation. Not infrequently after the administration of "magisterium bismuthi" there is observed a peculiar discoloration of the tongue. According to T. Lawrence Hamilton this is due to a change of the bismuth salt through the sugar formed by the action of the saliva on the starchy food. The therapeutic indications in the untoward effects named, are a discontinuance of the drug and the employment now and then, of calcined magnesia, or of milk in an emul-

sion, etc. * The same authority gives abstracts of the investigations of such men as Monneret, Carnot, Riche, Bouchut and Orfila.†

The condition of the individual may have an influence, in so far as the presence of undue quantities of acid in the stomach may favor the conversion of the basic subnitrate of bismuth into the corrosive neutral salt; or, if this should be decomposed by water the acid salt may be formed in great quantities. These neutral and acid bismuth salts are, as Orfila demonstrated by his experiments on animals, intense poisons, setting up gastro-enteritis. The same effects would naturally ensue if the basic salt were given simultaneously with acid remedies, or if the patient should take acids after the drug. A readily soluble bismuth nitrate would thus be formed in the stomach and would be absorbed.‡ Lewin furthermore states: Opinions are divided as to the reason why the much-used basic bismuth nitrate, and sometimes even in small doses, causes violent irritation of the stomach and bowels. It has been conclusively proved that the reiterated assertion that these untoward effects are due to the lead or arsenic in the bismuth can not be true, the quantities thus contained being usually too small. §

Bernatzik–Vogel: Lehrbuch der Arzneimittellehre, 1886, p. 183, quotes the results of a number of investigators.

S. Fraenkel: Arzneimittelsynthese, ii, 1906, in a chapter on Wismut, pp. 592-601, speaks of poisoning by bismuth snbnitrate.

Poisoning by bismuth subnitrate, in Münch. Med. Wochenschr., 1907, 1934, abstracted in Pharm. Centralhalle, 1909, 56.

Poisoning by bismuth subnitrate and substitution of subcarbonate for this salt by E. Meyer, in Münch. Klin. Woch., Chem. Abst., ii, No. 22, p. 3110.

Ewald: Handbuch der Arzneiverordnungslehre, xii, 1892, p. 207, states that Hannon prefers the subcarbonate to the subnitrate, because it is easier soluble in the gastric juice and does not cause constipation. Bismuth subcarbonate is used mostly in France, and especially in Holland.

Hatcher and Wilbert in their excellent book, The Pharmacopœia and the Physician, 1907, state on p. 148: Bismuth subnitrate or subcarbonate, when triturated with water should form a creamy mixture, and the physician should not permit the use of that which readily separates as a heavy powder, leaving a nearly clear stratum of liquid above it. The covering power of bismuth is in direct proportion to the creaminess of the mixture!

Prescher and Rabs: Apothekenlaboratorium, 1904, p. 9.;, state: Bismuth nitrate and a little water form a caustic salt, and with much water, the basic salt. Special attention must be paid to this in dispensing. Even the subnitrate can produce caustic effects when, instead of being triturated with plenty of water, it is taken dry or in wafers, and thus comes in con-

* Lewin-Mulherou: Untoward Effects of Drugs, p. 57.

† *Ibid.*, p. 55 and 56. ‡ *Ibid.*, p. 56. § *Ibid.*, p. 17.

tact with the gastric juice undiluted. (This statement would therefore also indicate that bismuth subnitrate should not be administered in tablet form.—O. R.)

The British Pharmaceutical Codex, published by our sister association, the Pharmaceutical Society of Great Britain, which has been severely criticised by the medical profession for publishing the therapeutic action of drugs, etc., makes the following very correct statement on page 165, which every pharmacist should well remember, "Bismuth subnitrate possesses astringent properties, owing to the free acid liberated when it is brought in contact with water."

Nitrite poisoning after the administration of bismuth subnitrate, by A. Boehme, Med. Klin. and Pharmak. Inst. Univ. Marburg, Arch. Exp. Path. and Pharm., 1907, vol. 57, p. 441, abst. Ph. Centralhalle, 1908, p. 136, reports two cases of the nitrite poisoning by bismuth subnitrate, and recommends that on account of the large number of cases of poisoning this salt should be replaced by a harmless bismuth preparation. Prof. Heffter has proposed bismuth hydroxide.

In connection with this I might be permitted to state that at the April meeting of our N. F. sub-committee I made a plea that bismuth hydroxide, N. F., should not be dismissed, as had been proposed, but should be recommended so physicians will prescribe it in place of the subnitrate. At the same meeting Prof. Dunning mentioned his experiments on the "Hydrolysis of Bismuth Subnitrate," which he has since published in an excellent paper in Druggists' Circular, July, 1909.

As pharmacists it is our duty to point out the incompatibilities of bismuth snbnitrate and the poisonous effects which this salt might produce especially in infants and children, to the physicians and recommend them to prescribe the subcarbonate or the hydroxide. Especially the bismuth hydroxide should be used more in medicine and pharmacy, as it is far superior, being entirely free from these objectionable properties of the subnitrate.

In a note below the monograph of "Bismuthi Hydroxidum," the three editions of the N. F. also give a formula for a liquid preparation, *Cremor Bismuthi*, or *Cream of Bismuth*, by triturating 20 parts of hydroxide with 80 parts of water.

As early as May, 1905, I published in the Bulletin of Pharmacy, p. 215, a formula for

Improved Cream of Bismuth:

Bismuth hydroxide N. F., freshly precipitated	20 Gm.
Glycerin	20 Gm.
Distilled water, a sufficient quantity to make	100 Gm.

This makes a superior preparation, as the glycerin helps to diffuse the bismuth hydroxide.

In discussing the pharmacy of bismuth preparations, Proctor, of New-

castle, says in his "Lectures on Practical Pharmacy": "It has been felt to be a desideratum to have a bismuth preparation smooth, tasteless and well suspended. The French have such under the name of Crème de Bismuth-Quesneville, which consists of freshly precipitated subnitrate washed but not dried and mixed with syrup of gum. English nostrums have also been introduced under the name of Lac Bismuthi, probably prepared upon similar principles. So far as my experience goes, the bismuth compounds for this preparation are the oxychloride or the hydrated oxide, either of which makes a good, milky-looking liquor when rubbed with gum and water in the proportion of 1 dram of the bismuth compound, 2 drams of mucilage of acacia, and water to make 1 ounce. It is better, though not essential, that the bismuth precipitate be used in its undried state. Under any circumstances a partial subsidence takes place, but the supernatant liquid remains milky in appearance and the sediment readily shakes up. To make the 'Lac Bismuthi' from the moist precipitate, 1 ounce of the official (B. P.) white bismuth (for the benefit of the members I will explain that the official title for bismuth subnitrate in the British Pharmacopœia of 1864 was 'Bismuthum Album'! O. R.) may be dissolved with the aid of heat in the smallest quantity of hydrochloric acid, and this acid solution poured into an excess of ammoniacal water, the precipitate collected on a filter, washed, drained, etc., to get rid of the excess of water. It is then rubbed with 2 ozs. of mucilage of acacia and water q. s. and 8 fl. oz. Each fluidounce represents 1 dram of white bismuth."

Although such authorities as Proctor, Dorvault in his "L'Officine," 10th ed., p. 268, old Hager, 1891, vol. i, p. 612, and the new Hager's Pharm. Praxis, 1907, vol. i, p. 490, state that Crème de Bismuth-Quesneville, a small bottle, about 5 oz., retails in France for 5 francs and wholesales in the United States for $1.13, consists of freshly precipitated bismuth subnitrate, which no doubt it was years ago, this proprietary article, in my opinion, consists now of hydroxide. In fact, according to its label and serial number, and guaranteed under the Food and Drugs Act, you can take it to be either or both, as the following names are given: Bismuth Cream, Bismuthi Oxidum Hydras, Hydrate d'Oxyde de Bismuth, Crème, Pâte, Bouillie, Hydrate Gélatineux, *Sous-Nitrate de Bismuth demi-liquide!* In the circular it is stated that "Bismuth Cream" has replaced the subnitrate. Besides this misleading nomenclature, sanctioned by the Pure Food and Drugs Act, there is another great objection to this preparation, and that is for not giving the amount of bismuth salt it contains. Thus physicians and patients are at the mercy of the manufacturer regarding the strength of the preparation, as it has no fixed standard!

According to Peter MacEwan, the editor of "The Chemist and Druggist," London, in his excellent book, "Pharmaceutical Formulas," Lac Bismuthi is the trademarked title of an English nostrum, prepared by suspending the freshly precipitated bismuth hydroxide in a mixture of glycerin, chloroform water, orange flower water and water.

In our own country several such "Creams, Milks, Lacs or Mixtures" are in the market, mostly under fancy names. After the reading of my paper on "Bismuth Hydroxide" before this Section at last years' meeting, Prof. Asher mentioned that the so-called "Cream of Bismuth" sold around New Orleans contains bismuth subcarbonate and not hydroxide (Proc. A. Ph. A., vol. 56, p. 1015).

On various occasions formulas have been published containing acacia or tragacanth in order to keep the bismuth salt in suspension. *The addition of such gummy suspending agents*, as also advised by Proctor, is very objectionable, pharmaceutically and therapeutically, because they cause the insoluble bismuth salts to cohere and form indiffusible masses, which will settle in the bottom of the bottle.

In prescriptions specifying such gummy substances, the physician, who generally is not a pharmacist, should be notified and the addition of glycerin or syrup should be suggested to him. At this time I might also call attention to a very common prescription, *i. e.*, bismuth subnitrate and sodium bicarbonate together in an aqueous mixture. The liberated nitric acid will react on the bicarbonate and generate CO_2 which, if the patient is not warned to release the cork, may burst the bottle. The Br. Pharm. Codex says on this subject p. 166: "In consequence of the hydrolysis with liberation of nitric acid, which this salt undergoes in the presence of water, it should not be presented with alkali carbonate or bicarbonates; the bismuth oxide or subcarbonate should be used instead." Far better than that, in my opinion, would be to use, with the physician's consent, the hydroxide, or still better, get your physicians to prescribe *magma bismuthi, the ideal bismuth preparation.* As I pointed out in my paper "Bismuth Hydroxide" before this Section last year I have had some experience in the preparation of the hydroxide and also of the "magma," "cremor or cream, lac or milk, mistura or mixture" or whatever name you wish to give it. The results of these experiments, which have lasted over 3 years, I hereby most willingly give to the A. Ph. A. members. In the preparation of bismuth hydroxide, as well as magma, I found ammonia water better suited than sodium or potassium hydroxide, which are recommended by MacEwan, etc., because the precipitate in the first case is of a pure white color and in the two other instances possesses a yellowish color.

The strength of the preparation, I have adjusted so that 4 Cc. (1 fluid-drachm) represents the equivalent of 0.3 Gm. (5 grains) of bismuth subnitrate, that is 1000 Cc. magma bismuthi contain 80 Gm. My first attempt, 3 years ago, was to pour a diluted acid solution of bismuth subnitrate, *i. e.*, a solution of bismuth trinitrate, into diluted ammonia water. I thus obtained a precipitated bismuth hydroxide, which was gelatinous, which would form into a mass or a curd resembling potcheese, and which furthermore would not stay in suspension. This explains to me why formerly these gummy substances were added.

What is wanted is a nice white, smooth, homogeneous magma, in a finely divided state, with *very little liquid or water on top.* This is the desideratum upon which I based my experiments. All that is needed to produce such an ideal preparation is the *addition of a small amount of ammonium carbonate.* How simple after you know it! Sodium or potassium carbonate or bicarbonate are not suited as well, as the resulting magma will have a yellowish color and will never be pure white.

Dilution of the two solutions.—

The alkaline solution consists of	
Ammonium carbonate	20 Gm.
Ammonia water	400 Cc.
Water	12000 Cc.

Prepare in a large glass or stone jar, of double the capacity, and put in cold place.

The bismuth solution is prepared as follows:

Bismuth subnitrate	80 Gm.
Water	60 Cc.
Nitric acid	50 Cc.

Dissolve by agitation, then pour in a thin stream to a cold mixture of

Water	8000 Cc. and
Nitric acid	30 Cc.

I prepare this bismuth solution in a jar with a lip, as f. i. a precipitating jar. If prepared in an ordinary bottle, then this solution can only be *slowly* added to the alkaline solution, whilst it is very important, in order to obtain a bulky precipitate, to pour *the bismuth solution quickly into the alkaline solution.*

RULES AND PRECAUTIONS NECESSARY IN THE PREPARATION OF MAGMA BISMUTHI.

The colder, the more dilute, and the quicker and without stirring the two solutions are mixed by pouring the bismuth into the alkaline solution, the bulkier and more finely subdivided will be the resulting precipitate.

The warmer, the more concentrated, and the slower and with constant stirring the two solutions are mixed, the heavier and denser will be the precipitate.

Another very important point is, that the *addition of ammonium carbonate* and the formation of bismuth subcarbonate serves to hold the precipitated gelatinous bismuth hydroxide in suspension. The more carbonate is formed, then the bulkier will be the magma. The addition of 10 Gm. ammonium carbonate to the liter, was in my experience, not quite

sufficient, because a denser magma (about 600 Cc.) resulted with too much water (about 400 Cc.) on top. For this reason I have increased the amount of ammonium carbonate to 20 Gm. If, on the other hand, 30 Gm. are used, then the resulting magma will measure about 2000 Cc. instead of 1000 Cc.

Method of Precipitation.—As emphasized before, the dilute and cold bismuth trinitrate solution must be poured quickly, *not slowly* and with constant stirring, into the very dilute and cold alkaline solution.

Reactions of the mixed solutions must necessarily be distinctly alkaline.

Precipitation and Washing of the Precipitate.—I find that the magma will completely subside in one to two hours. The supernatant liquid is then decanted, or, still better, is syphoned off, as this will remove it more completely and will not disturb the precipitate. While distilled water is no doubt the best, I find that hydrant water filtered through a Berkefeld (Kieselguhr) filter will also answer and will not discolor the precipitate. Of course all utensils must be perfectly clean, and no dust, etc., must be allowed to contaminate the magma.

The cost of magma bismuthi will only be 30–35 cents per liter, which certainly represents quite a difference from the price of the proprietary preparations. And, besides the saving effected, the preparation of this elegant galenical should certainly be a pleasure to the *real* pharmacist.

Proposed Formula and Monograph for the National Formulary.—

MAGMA BISMUTHI.

Bismuth Magma.

(Milk of Bismuth).

Bismuth subnitrate	80 Gm.
Nitric acid	80 Cc.
Ammonium carbonate	20 Gm.
Ammonia water	400 Cc.
Distilled water, a sufficient quantity to make	1000 Cc.

Mix the bismuth subnitrate with 60 Cc. of distilled water and 50 Cc. of nitric acid in a flask and promote the solution of the salt by agitation, and, if necessary, by a gentle heat. Then pour this solution in a thin stream and with constant stirring into 8000 Cc. of distilled water, previously acidulated with 30 Cc. of nitric acid. This bismuth trinitrate solution is best prepared in a jar with a lip. Dilute the ammonia water with 12000 Cc. of distilled water in a glazed or glass vessel of almost double that capacity, dissolve the ammonium carbonate in this solution, and then pour the bismuth solution quickly * into it. Test the mixed liquids, and if not distinctly alkaline add a sufficient quantity of ammonia water. Let the mixture stand during two hours so that the precipitate may subside,

* If the bismuth solution is poured slowly and with constant stirring into the ammonia solution, the resulting precipitate will be heavier and denser.

then pour off, or better, syphon off the supernatant liquid, and wash the precipitate three times by decantation, etc., with distilled water. The last washing should be done in a graduated bottle, and when the magma has subsided to 1000 Cc., syphon off the supernatant liquid.

Strength Rubric: 4 Cc. (1 fluidrachm) of magma bismuthi represents the equivalent of 0.3 Gm. (5 grains) of bismuth subnitrate in the form of hydroxide together with a little subcarbonate.

Average Dose: 8 Cc. (2 fluidrachms).

Conclusion.—In conclusion, I also beg to state that, in case this or a similar formula for the preparation of "Magma Bismuthi" is adopted in the next edition of the National Formulary, then the note N. F. III, p. 5, regarding Cream of Bismuth should be dismissed, as the formula given there does not produce a satisfactory homogeneous preparation, whilst the proposed *Magma Bismuthi is an ideal galenical for internal as well as cosmetic use.*

At the same time I would like to point out to the N. F. Committee, as well as the U. S. P. Revision Committee, that the correct way of writing "Bismuth" is "Bismut," the "h" is superfluous (Schelenz), and the scientists have agreed on this spelling (Pharmazeutische Zeitung, Berlin, 1905, p. 701). This orthography has been adopted by all the leading chemical and pharmaceutical works, and also by the German, Russian and Swiss Pharmacopœias and the Ergänzungsbuch (Supplement to the German Pharmacopœia), which corresponds to our National Formulary.

In case any of the members wish still further particulars, although I have made the explanations as explicit as possible, regarding this Magma Bismuthi, I shall be only too glad to answer further questions.

Last, but not least, I would like to have it clearly understood that Magma Bismuthi is *not an imitation* of the various proprietary preparations, but that it is a superior galenical, which the pharmacist *can* and *should* manufacture *himself.* Unlike the proprietary articles, our Magma Bismuthi is of a definite purity and strength, and for those reasons physicians *should*, and *no doubt will*, prescribe it.

July 25, 1909.

Mr. Wilbert also abstracted the papers by the same author upon "Liquor Picis Carbonis" and "Burow's Solution," the full text of which here follows:

LIQUOR PICIS CARBONIS.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

In looking over the literature, I find as early as 1867 in the Proceedings of A. Ph. A., vol. 15, p. 157, the following abstract from D. C., xii, 135: "Liquor carbonis detergens, a new form of antiseptic for local application, is said to be an alcoholic solution of coal tar, containing probably carbolic

acid and other acids, with dark tarry matter. It forms a permanent emulsion with water."

Very likely this refers to a British proprietary preparation, "an antiseptic solution of coal tar," which retails in England for 1 *s.* 1½ *d.* and in the United States for 50 cents per 3-ounce bottle. It is a cloudy liquid of dark brown color by transmitted light and almost black color by reflected light, with a heavy sediment in the bottles. It contains about 65 per cent. of alcohol, and when diluted with water forms a grayish-brown emulsion.

Under the same title, "Liquor Carbonis Detergens," I find in the second edition of that excellent work of Prof. Dr. Josef Moeller and Prof. Hermann Thoms, "Real-Enzyklopædie der Gesamten Pharmazie," vol. viii, p. 256, the following formula taken from the "Hamburger Vorschriften" and of "The Muenchener Apotheker Verein":

Coal tar ..... 1 part.
Tincture of quillaja.. 2 parts (20 per cent. Quillaja and *68 per cent. alcohol*).
Set aside eight days and filter.

Exactly the same formula under the same title is official in the "Ergaenzungsbuch," 3d ed. (Supplement to G. P.), which, however, is not mentioned by the "Real-Enzyklopædie." The directions are to mix, set aside in a moderate temperature for eight days, frequently agitating, and then filter. The description states "*a clear, brown liquid.*" The "Dresdner Vorschriften," 1900, a copy of which Dr. Schweissinger was good enough to send me, orders:

Coal tar ..... 32 parts.
Tincture of quillaja..... 76 parts.
Dissolve (*but it does not dissolve*), and filter after eight days' standing.

The only "liquor" in the Pharmacopœa Helvetica IV is

Liquor Carbonis Detergens.

Saponinteer—Coaltar Saponiné—Coaltar saponato.

Pix Lithanthracis(official) 20
Tr. Quillajæ (20 per cent. with *45 per cent. alcohol*) 80
Macerate 8 days and then filter.

Brown-black clear liquid with a coaltar odor.

The same formula is given by the Formulary of the Luxemburg Apotheker Verein, 2nd ed., 1907 as tinctura lithanthris saponinata, teinture de coaltar saponinée and liquor carbonis detergens. As will be noticed these various formulas all differ in strength, etc. The excellent Pharmazeutischer Lexicon of Dr. et Mag. pharm. Max von Waldheim even gives the proportion as 1 + 8.

All the formulas, given so far, employ no heat but *merely cold macera-*

tion. I have tried all these formulas, but have *not* found the preparations reliable, as they do not produce homogeneous emulsions when diluted with water, which is the desideratum. Next I consider the formulas in which *heat is employed.* The Codex Medicamentarius Gallicus, the new French Pharmacopœia 1908 under the French title: Teinture de quillaja coaltarée, Latin title: Tinctura quillajæ et coaltari orders 1 part coaltar, which is official under the novel Latin title: *Coaltarum!* 4 parts tinct. quillaja (20 per cent. with *80 per cent. alcohol*) to be digested for one hour on the water-bath, then cooled and strained. The Pharmacopée Française, which otherwise gives physical and chemical characteristics of its galenicals, *omits* the description of this preparation. Mixed with 4 parts of water it forms the official Émulsion de coaltar, Latin title: Emulsio coaltaris, to which the Luxemburg Formulary adds the synonym, "Coaltar saponiné Le Beuf," a French specialty, 150 Gm. = 2 francs (cost wholesale in U. S. = 40 cents) and only worth fr. 1.25 according to statement in above Formulary.

The French Pharmacopœia formula yields a better preparation than the preceding formulas. Through numerous experiments I have still further improved by using a 10 per cent. tincture of quillaja prepared with *95 per cent. alcohol* (instead of 80 per cent.), and digesting therein the coaltar for one hour on the water-bath. By this modification you can obtain an excellent "Liquor Carbonis Detergens," which when diluted with water will form a permanent "Emulsion of Coaltar," in the short time of one hour.

In the first edition (1887) of the Unofficial Formulary of the British Pharmaceutical Conference (B. P. C.) I find the following two preparations.

Pix Carbonis Præparata.

Prepared Coaltar.

Place commercial coaltar in a shallow vessel, and heat at a temperature of 120° F. for one hour, stirring frequently.

Liquor Picis Carbonis.

Solution of Coaltar.

Prepared coaltar 4 ounces.

Tinct. of quillaja 20 ounces (10 per cent. quillaja with *90 per cent. alcohol.*)

Digest at a temperature of 120° F. for *two days*, occasionally stirring, cool, and decant or filter.

These two formulas also appear in later editions of the B. P. C. and were adopted into the British Pharmacopœia, 1898.

In connection with these two formulas I beg to offer the following comments. In the first place, English coaltar, being manufactured almost

entirely from cannel coal, is very likely of a somewhat different composition from our American coaltar. There is, in my opinion, no advantage in the Br. P. *Prepared* Coaltar. The original object undoubtedly was to drive off the ammonia, but besides the ammonia the heating for one hour at 120° F. will also volatilize some other valuable constituents, as f. i. benzene, toluene etc., which most certainly is a disadvantage. Furthermore, in our country the ammonia, on account of its price is generally entirely removed before the coaltar is offered for sale.

The directions of the Br. P. in liquor picis carbonis to digest the ingredients at a temperature of *120° F. for two days* are certainly very impracticable and are generally not within the power of the retail pharmacist. Besides that I found that it is unnecessary to heat for such a long time. As stated above, my modification of the French Codex process, digesting on the *water-bath for one hour*, will yield an excellent preparation.

Of course I use a 10 per cent. tincture of quillaja *prepared with 95 per cent. alcohol*, instead of *90 per cent. of Br. P.* or *80 per cent. of French Codex*. My reasons are the following:

1. The stronger the alcohol, the more coaltar constituents will it dissolve and the quicker will it dissolve them. This can be very easily proven by agitating the same quantity of coaltar with the same amounts of alcohol of different strength. A 95 per cent. alcohol will immediately assume a golden-yellow color and become fluorescent, and after 10 minutes shaking a red-brown solution will be formed, which by itself, when mixed with water, will form an emulsion. In connection with this I will point out the incorrect statement in B. P. Codex, p. 900: "Coaltar is *non-soluble* in alcohol, ether, chloroform, benzene, etc," which statement I do not find corrected in the Supplement of Aug. 1, 1908, and which undoubtedly should read: "Coaltar is *partly soluble* in alcohol, etc."

2. The saponin, that is, the quillajasapotoxin and the quillajic acid, are extracted from quillaja by the alcohol, and this tincture, or alcoholic solution, will dissolve *more* of the alcohol-soluble constituents of coaltar, and, when mixed with water, will help to keep them in proper suspension in the emulsion which is formed. This I have proven by making solutions of the same strength in 95 per cent. alcohol and in tincture of quillaja, prepared with 95 per cent. alcohol. The latter will invariably be darker and stronger.

Although you can obtain an excellent liquor picis carbonis, by heating on the water-bath within one hour, this *warm process* is not necessary, as you can obtain the same results by *cold maceration for about seven days*. To prove this I have made the following experiments:

1. Maceration of 200 Gm. coaltar in 1000 Cc. tinct. quillaja (10 per cent. and 95 per cent. alcohol.

2. Maceration of 200 Gm. coaltar with 100 Gm. powd. quillaja and 1000 Cc. alcohol.

3. Maceration of 200 Gm. coaltar with 5 Gm. saponin (commercial) 1000 Cc. alcohol.

The liquor picis carbonis obtained by these three modifications is about the same, with the exception that the one prepared with saponin has a light-brown color, and when mixed with 4 parts of water, it will form a more yellowish emulsion, which, however, does not foam so much, *i. e.*, is not as detergent as the other preparations. This point can be remedied by increasing the amount of saponin.

Liquor picis carbonis prepared according to Modification No. 1, has that advantage that it does not need filtering, as it is ready for use by decanting.

I also learned that it is much better to add the coaltar to the tincture, as the mixture can then be easily shaken, as the coaltar will be disintegrated. If the reverse is done, then the coaltar will adhere to the sides of the bottle or form into a solid lump.

RESULTS.

1. That the U. S. P. tr. quillajæ (35 per cent. alcohol) is not suited, as, no matter how long the coaltar is macerated or even digested therein, the finished preparation *will not emulsify with water*.

2. That even tr. quillajæ prepared according to the French Codex with 80 per cent. alcohol, does not dissolve enough of the coaltar constituents.

3. That in order to obtain a desirable liquor picis carbonis it is best to use a 10 per cent. tr. quillajæ prepared with *95 per cent. alcohol*, which will even dissolve more than the Br. P. tincture prepared with *90 per cent. alcohol*.

4. That it is unnecessary, in fact a disadvantage to use, as Br. P. directs, "prepared coaltar," as by the heating for one hour valuable constituents are volatilized.

5. That it is impracticable to follow the Br. P. directions to digest the ingredients at a temperature of 120° F. for two days to prepare liquor picis carbonis.

6. That such a procedure is unnecessary, as an excellent preparation can be obtained:

A. By warm process, *i. e.*, digesting for one hour on water-bath.

B. By cold process, *i. e.*, macerating for seven days.

C. Strength: 200 Gm. coaltar and 1000 Gm. tinct. quillaja to make 1000 Cc. liquor picis carbonis.

D. Emulsion of coaltar: mix 200 Cc. liquor and 800 Cc. water.

These experiments, together with the results obtained, I respectfully submit to our N. F. committee, so as to be helpful in the construction of a formula and monograph for liquor picis carbonis.

August 3, 1909.

BUROW'S SOLUTION.

BY OTTO RAUBENHEIMER, PH. G, BROOKLYN, N. Y.

Need of a Standard Formula for this Solution.

Although originated over half a century ago, the average druggist is at a loss to know what Liquor Burowii or Burow's Solution means. The notes and queries columns of the various drug journals almost every month give testimony to that effect. I myself within the last few years have put up a number of prescriptions calling for Liquor Burowii, which the patients were unable to get filled at other pharmacies, or rather drug stores. Being always ready to give whatever little knowledge I possess to my pharmaceutical brethren, I have cheerfully answered a large number of inquiries, both by mail and telephone, for the formula of this preparation.

Short Biography of Prof. Dr. Burow.

August Burow was born November 10, 1809, in Elbing, Germany, studied medicine at the University of Koenigsberg under such celebrated professors as Baer, Sachs and Burdach, and also Diffenbach, of Berlin. In 1846 he founded his famous chirurgical clinic, to which patients came from all parts of Germany, Polen and Russia. From 1844 to 1859 Dr. Burow was professor of surgery at the University of Koenigsberg. He was consulting surgeon general during two wars, *i. e.*, in 1866 in the army of v. Manteuffel and in 1870 in the army of Prince Friedrich Karl. Prof. Burow died in 1874 at Koenigsberg, and his son Ernst succeeded him at the University and also continued the famous clinic. A large monument has been erected at Koenigsberg in honor of Prof. Burow.

Origin of Burow's Solution.

Fortunately I am acquainted with the now 70-year-old German apotheker Mr. R. Staebler, of Newark, New Jersey, a still active member of our New Yorker Deutsche Apotheker Verein. Mr. Staebler was kind enough to give me the following particulars as to the origin of Burow's Solution:

During 1856 and 1857 Mr. Staebler was provisor at Bretschneider's pharmacy in Koenigsberg, which was visited daily by Prof. Dr. Burow. As a surgeon Burow was much in favor of the open antiseptic treatment of wounds, which treatment he and also his son recommended in numerous papers and before chirurgical and international medical congresses.

During the year of 1857 Prof. Burow came to Bretschneider's pharmacy and handed Mr. Staebler a prescription ordering a solution of alum and a solution of sugar of lead to be mixed and then filtered after allowing the precipitate to subside. This was the origin of Burow's Solution, which he at first used, and successfully used, in the open antiseptic treatment of wounds and gangrene. This solution possesses cooling, disinfecting, antiseptic, germicidal, healing, preserving and astringent properties. It is used, in proper dilution of course, as lotion, gargle, ointment, injection or

douche. In fact, Liquor Burowii, or its successor, Liquor Aluminii Acetici, has become a household remedy in Europe.

Prof. Burow Introduced Aluminum Acetate into Pharmacy and Medicine.

It is true that as early as 1827 the Alsacian pharmacist and chemist, Jean Nicolas Gannal, who made a special study of the conservation and preservation of animal parts, recommended aluminum acetate in embalming liquids (Schelenz, Geschichte der Pharmazie, p. 661). It is true that the great physicist and chemist, Josephe Louis Gay-Lussac (1778–1850), published, in "Annales de Chimie," lxxiv, 193, and "Annales de Chimie et de Physique," vi, 201, and "Schweigger's Journal," xxi, 96, processes for the preparation of solution of aluminum acetate by dissolving aluminum hydrate in acetic acid, or by the decomposition of sugar of lead and alum, the latter solution to be used in the textile industry. It is true that the great Swedish chemist, investigator and teacher, Jons Jakob Berzelius (1779–1848), who developed and enriched chemistry in its most important branches as hardly any other man has done, described aluminum acetate in "Poggendorff's Annalen," xvi, 413.

Prof. Burow did not discover aluminum acetate or the solution, but he most certainly deserves credit for introducing the antiseptic solution, which bears his name, into the materia medica. Let us hope that the name of Burow will continue to live in pharmacy and medicine, and also let us hope that Burow's Solution will remain an everlasting monument to the professor, the same as the monument erected in Koenigsberg!

Modifications of Burow's Solution.

The original solution after the precipitation of Prof. Burow was prepared by the double decomposition of solutions of alum and lead acetate in 1857. A trace of the precipitated lead sulphate will be dissolved, the higher temperature the more will go into solution, which however is no harm, on the contrary will improve the preparation as an external application. If this solution is prepared carelessly, or if an excess of sugar of lead is taken, or if not enough alum is used to entirely decompose the lead acetate, then Burow's solution may contain quite some lead, not merely a trace of lead sulphate, but also some undecomposed lead acetate. It was for that reason that Hager already gave warning not to dispense Burow's Solution containing lead, in fact he claimed that it was a bad, uncertain, poisonous preparation. It was for the same reason that 25 years after Prof. Burow originated his solution the German Pharmacopœia 2nd ed. 1882 admitted Liquor Aluminii Acetici prepared in an entirely different manner, and free from lead.

The modifications of Burow's Solution are many.

The veteran pharmacist Rich. Staebler, of Newark, N. J. was kind enough to loan me a little formulary about the size of the N. Y. and Brooklyn Formulary namely "Manual des New-Yorker Deutschen Phar-

mazeutischen Vereins, published in *1858*. This manual was undoubtedly the first formulary of its kind in the U. S. and might be called the forerunner of our National Formulary. It was published by the Verein in order to obtain *uniformity* in the preparations, especially foreign galenicals. In this little book I find

Liquor Aluminis Acetici.

℞ Aluminis crudi..... Partes decem.
Plumbi acetici..... Partes septemdecim.
Gas hydrothionici.
Aquae ana sufficientem quantitatem.

Dissolve alum and lead acetate each separately in the smallest possible amount of hot water. Mix the solution, allow the precipitate to subside, and then filter. Conduct a stream of H_2S into the filtered solution to precipitate all the lead, warm to dispel the gas, then filter and add sufficient water to make 48 parts.

One ounce of the liquor contains one drachm alum. acetic.

This formula of 1858 is practically the same, except in strength, as the Liquor Aluminii Acetici Crudus of the "Ergänzungsbuch," 3d ed., 1906, published by our sister association, the Deutscher Apotheker Verein, Berlin.

Hager, in 1871, proposed a process decomposing alum with solution of basic lead acetate, and only lately Dr. W. van Rijn (Pharm. Weekbld, 1908, 535) proposed this again as something *new!*

The Swiss, the Italian, and the Russian Pharmacopœias, as can be seen by the comparative table, added a small amount of sodium sulphate, besides lead acetate and alum, very likely with the idea of surely precipitating all the lead and to increase the solubility of the alum.

Eugene Dieterich made a notable improvement by taking the more soluble aluminum sulphate instead of alum. By using alum he claims Burow's Solution will unnecessarily contain potassium sulphate, which will make the solution somewhat denser and will prevent the lead sulphate from precipitating completely. (Dieterich Ph. Manual, 9th ed., 1904, p. 265.)

It is my opinion that the potassium sulphate formed when using alum, as well as the sodium acetate formed when adding sodium sulphate, dissolve a little more lead sulphate, which opinion I have expressed before in D. C., June, 1908, p. 275.

It is very important to set the two solutions in a cold place and mix them by slowly pouring, with constant stirring, the lead acetate solution into the alum or aluminum sulphate solution. Set aside in a cold place, the colder the better, for several days to allow the precipitate to subside completely, then syphon off and filter if necessary. It must be borne in mind that at a temperature above 10° C. (40° F.) a little more lead sulphate is dissolved. For this very reason I would advise pharmacists to prepare their stock of Burow's Solution during the winter.

COMPARATIVE TABLE OF FORMULAS AND STRENGTH.

	Lead Acetate.	Alum.	Alum. Sulph.	Sod. Sulph	Water.	Strength. H_2S.	
1. Liquor Aluminii Acetici, Manual N. Y. Deutsch. Pharm. Verein, 1858	17	10	—	—	ad. 48	q. s.	12.5 per cent. ℥ i = ℥ i alum. acet.
2. Helvet. ii and Ital., 1872	80	53	—	10	650	—	
3. Hager Ph. Prax. i, 1876; Ph. Russ. iii, 1880; Alumina Acetica Soluta.	100	66	—	12	800	—	2 per cent. dry $Al_2(OH)_6$ = 1.3 per cent. Al_2O_3.
4. Dietrich's Manual ix, 1904	100	—	60	—	800	—	
5. Real-Encyclop., 1887, Geissler and Moeller, vol. ii	30	22.5	—	—	360	—	
6. Chas. Rice, Hosp. Form., 1898	14	3	—	—	ad. 500	—	
7. Ergänz. Buch iii, 1906, Liq. Aluminii Acet. Crudus	151	95	—	—	700	q. s.	5 per cent. alum. acet. = 1.25 per cent. Al_2O_2; also contains 2.4 per cent. pot. acet. and a little pot. sulph.
8. Do i, 1891	Alum. na tr. carb. a nd ac. ac etic.				ad. 200	—	5 per cent. alum. acet.
9. Ewald, Bernatz-Vogel, Nat. Disp. 5th, 1894; Therap. Gazett ix, 727; so-called Bruns modific.	115	72			ad. 1000	—	3 per cent. alum. acet.
10. Liquor Burowii, improved, Hager, 1891, vol. iii, p. 75	Liq. alum acet. gly c. (8 per cent.), 1				ad. 10	—	0.8 per cent. alum. acet.
11. A. Halpern, D. C., 1908, p. 172	220		125		ad. 1000		Said to give a negative test for both alum and lead sulphate. In my opinion fallacious.

Comparison of Formulas and Strength of Burow's Solution.

As can be seen by my "Comparative Table" the formulas and modifications of Liquor Burowii are many, too many in fact. As far as I can learn the original formula of Prof. Burow is No. 5 recorded in Vol. ii, p. 317 of the first edition of that great German work Real-Enzyclopædie der gesamten Pharmazie by Dr. Geissler and Prof. Moeller. Formulas No. 2 and 3, are identical and are the ones generally quoted in different books and in the Formulary of the Cincinnati Academy of Pharmacy and in the Formulaire de Préparations Pharmaceutiques adopté par la Société de Pharmacie d'Anvers.

In the "Strength Rubric" you will notice that the different formulas vary from 12.5 per cent. down to 0.8 per cent. aluminum acetate, certainly quite a large range. However it is generally understood that Burow's Solution should contain 5 per cent. aluminum acetate.

Stoechiometric Calculations.

In order to determine the exact proportions of the chemicals which enter Burow's Solution, I made the following calculations, employing chemical formulæ and molecular weights of U. S. P. VIII.

$$\underset{376.15\times 3}{3(Pb(C_2H_3O_2)_2+3H_2O)}+\underset{471.02\times 2}{2(AlK(SO_4)_2+12H_2O)}=\underset{202.64\times 2}{2Al(C_2H_3O_2)_3}+$$

1128.45 942.04 405.28

$$K_2SO_4+3PbSO_4+33H_2O.$$

i. e. 100 cryst. lead acetate require 83.75 cryst. alum to produce 35.03 aluminum acetate.

$$\underset{1128.45}{3(Pb(C_2H_3O_2)_2+3H_2O)}+\underset{625.93}{Al_2(SO_4)_3}+16H_2O=\underset{405.28}{2Al(C_2H_3O_2)_3}+3PbSO_4+25H_2O.$$

i. e. 100 cryst. lead acetate require 55.38 cryst. aluminum sulphate to produce 35.03 aluminum acetate.

$$\underset{376.15\times 4}{4(Pb(C_2H_3O_2)_2+3H_2O)}+\underset{942.04}{2(AlK(SO_4)_2+12H_2O)}+\underset{319.91}{Na_2SO_4}+10H_2O=\underset{405.28}{2Al(C_2H_3O_2)_3}+$$

1504.60

$$2NaC_2H_3O_2+K_2SO_4+4PbSO_4+46H_2O.$$

i. e. 100 cryst. lead acetate require 62.61 cryst. alum and 21.26 cryst. sodium sulphate to produce 26.93 aluminum acetate.

The results of these calculations teach us that the addition of sodium sulphate is unnecessary; in fact, is not economical, as we have to use more lead acetate and obtain less aluminum acetate.

Eugene Dietrich states, in his excellent Pharmaz. Manual, 9th ed., p.

265, that 54.09 aluminum sulphate (which in his formula he increased to 60) is required to decompose 100 lead acetate. As this differs somewhat from my own calculation (55.38), I looked further into this subject, and found out:

1. That the aluminum sulphate of the German Pharmacopœia contains 18 molecules of water, while the U. S. P. VIII chemical has 16.

2. That using the molecular weights and formulas of the G. P., according to my calculation 100 lead acetate require 58.58 aluminum sulphate + $18H_2O$ (Dietrich = 54.09).

From my first two equations and figures I conclude the following:

100 lead acetate + 84 alum produce 35 aluminum acetate; consequently
150 lead acetate + 126 alum produce 52.5 aluminum acetate,

which together in 1000 Gm. or Cc. of finished liquor will be a 5 per cent. solution.

100 lead acetate + 56 aluminum sulphate produce 35 aluminum acetate; consequently
150 lead acetate + 85 aluminum sulphate produce 52.5 aluminum acetate,

which in 1000 Gm. or Cc. of finished Liquor Burowii will represent a 5 per cent. solution.

I have added a trifle more of the aluminum salt purposely, so as to be sure to precipitate all of the lead acetate and have a little alum or aluminum sulphate in excess. It must be borne in mind, however, that the three chemicals, especially when *powdered*, will lose some of their water of crystallization, and thereby gain in strength. And besides that, lead acetate is a somewhat unstable salt. The U. S. P. correctly orders it to be kept in well-stoppered bottles, and describes it as being efflorescent and absorbing CO_2 on exposure to the air. For these reasons I would advise the use of the more uniform crystallized salts in preference to the granulated or powdered chemicals.

Confusion About Liquor Burowii.

It is surprising what a confusion exists regarding Burow's Solution, not only that druggists do not know this preparation and that pharmacists dispense the official liquor alumini acetatis instead, but also standard books and journals name Burow's Solution as a synonym for the official liquor. The Pharmacopœa Austriaca, ed. vii, 1907, and the British Pharmaceutical Codex, 1907, both give the synonym Burow's Solution to the official liquor alumini acetici. I have called attention to this error before in D. C., June, 1908, p. 275.

Difference Between Liquor Burowii and Liquor Alumini Acetatis.

These two solutions are not identical, and there is a marked difference.

1. Burow's Solution contains a trace (but should *not* contain *more* than a trace) of lead. The official solution of aluminum acetate, the outcome

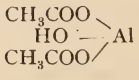
of liquor Burowii, having been first admitted into the Pharm. Germ., ii, 1882 (25 years after Prof. Burow originated his solution), being prepared in an entirely different manner, *contains no lead whatsoever.*

2. Difference in strength:

Liquor alumini acetatis contains from 7.5 to 8 per cent. *basic* aluminum acetate (N. F. and Ph. Germ. and Aust.), and up to 10 per cent. (Ph. Helv., iii); liquor Burowii should contain 5 per cent. *neutral* aluminum acetate.

3. Difference in constituents is a point which I want to emphasize, as the books do not bring this out strong enough.

Solution of aluminum acetate contains the *basic*, so-called two-third ($\frac{2}{3}$) aluminum acetate, $Al(OH)(C_2H_3O_2)_2$, because only two or the three valencies or bonds of aluminum are satisfied with the acetic radical, and the third one with a hydroxyl, as shown in the structural formula:



Burow's Solution, on the other hand, contains the *neutral* aluminum acetate, the three bonds being satisfied with the acetic radical.

Recommendations to the N. F. Committee.

1. For the reasons given above I would respectfully recommend to the N. F. Committee to change the title "Liquor Alumini Acetatis" to the more correct "*Liquor Alumini Subacetatis.*"

2. As there is a *demand*, and as there is a *need of a standard* for Burow's Solution, I would suggest the adoption of the following, or of a similar title and monograph, in the next edition of the N. F.:

LIQUOR ALUMINI ACETATIS CRUDUS.

Crude Solution of Aluminum Acetate.

(Liquor Burowii—Burow's Solution.)

Lead acetate, crystals	150 Gm.
Alum, crystals	126 Gm.
Water, a sufficient quantity to make	1000 Cc.

Dissolve the alum in 1000 Cc. of water, and to this cold solution add, with constant stirring, the lead acetate, previously finely powdered. Set aside in a cold place, below 10° C. (40° F.) for twenty-four hours, stirring occasionally, then syphon off the liquid, filter, and add enough water to make 1000 Cc.

This solution contains about 5 per cent. of *neutral* aluminum acetate.

In explanation, I beg to state that when using alum, which is only soluble in 8 to 9 parts of water, this modus operandi has to be resorted to. When it is desired to prepare this Liquor Burowii by mixing two solutions, then I propose the following alternate formula, etc.:

Lead acetate, crystals	150 Gm.
Aluminum sulphate	85 Gm.
Water, a sufficient quantity to make	1000 Cc.

Dissolve each salt in 500 Cc. of water; mix the cold solutions by pouring the lead solution in a thin stream, with constant stirring into the aluminum solution. Set aside in a cold place below 10° C., etc., etc.

The latter solution will have the advantage of being free from potassium sulphate and the disadvantage of being a little more expensive.

Lead-free Burow's Solution.

Should it be desired to have the solution entirely free from lead a trace of which, in my opinion, is rather an advantage than a disadvantage, then two methods can be employed:

1. Pass a stream of H_2S through a finished solution, which will precipitate all the lead as PbS; then set aside in shallow vessels to allow the excess of H_2S to evaporate and then filter. Heat cannot be employed to expel the H_2S, because at the same time the neutral aluminum acetate would be changed into the basic salt and a precipitate would be formed.

2. According to Atherton Seidell, "Solubilities," 1 liter of water will dissolve 0.041 $PbSO_4$, but only 0.002 $BaSO_4$ at 10° C. Mag. Ph. Gruening recommends in the Ph. Centralh. (abstr. by Prof. Diekman before our N. Y. Branch in June, 1909) to free the official liq. alum. acet., from the objectionable $CaSO_4$ by precipitation with a solution of barium acetate. This method I have also applied successfully to precipitate the dissolved lead sulphate in Burow's Solution.

Use of a Waste Product.

The precipitated lead sulphate, *i. e.*, the magma containing also some aluminum acetate, is an excellent preparation for painting on canvass, tents, etc., to make same water-proof. The lead sulphate will fill up the pores, and the aluminum acetate, which has been used in the textile industry since the time of Gay-Lussac, will be changed into the insoluble basic salt. Occasionally I sell this waste product at a fancy price to sportsmen, who are glad to obtain it.

Conclusion.

Let us hope that the next edititon of the National Formulary will contain a formula for Burow's Solution, which is a simpler, a *more permanent* and a *more effective* preparation than the official liquor alumini acetatis, or rather "*subacetatis*."

August 1, 1909.

Mr. Hallberg said this identical preparation was what started Pasteur in his great work in France—the theory for which Pasteur is so well known.

Mr. Lengfeld, of San Francisco, said he had made Burow's Solution with lead acetate, and he always got a flocculent precipitate, and at a certain temperature it gets cloudy. He had tried everything to overcome it but could not. He thought some of the members might be able to enlighten him on this subject.

The Chair suggested that when the paper of Mr. Raubenheimer was published in the Proceedings the gentleman would get all the points he wanted, as Mr. Raubenheimer had worked out the proposition there very thoroughly.

At the invitation of the Chair, Mr. Wilbert then presented in abstract his own paper on the perpetuation of elixirs in the National Formulary:

THE PERPETUATION OF ELIXIRS IN THE NATIONAL FORMULARY.

BY M. I. WILBERT.

With its advent as a legal standard the National Formulary has assumed an entirely different relationship to the practices of medicine and of pharmacy from the academic position formerly occupied as a suggestive book of desirable formulas.

Under its present status it is expected to reflect, in common with the Pharmacopœia of the United States, the actual needs and practices of the medical profession, as well as the sum total of scientific knowledge and ability possessed by members of the pharmaceutical guild.

Recognizing this difference in the status of the book, we must appreciate the fact that our individual responsibility to the content and the text of the National Formulary is such that unless we record our objection in no unmistakable manner, we, individually, will be classed as being in favor of all that the book contains and represents.

With the view of calling your attention to one of the fundamental shortcomings of the National Formulary, the perpetuation of formulas without duly recognizing or properly considering the advances that are being made in other lines of medical research and practice, I have compiled a list of the elixirs originally included in the New York and Brooklyn Formulary, the acknowledged precursor of the National Formulary, and have endeavored to trace their identity through all of the several editions of the latter book, including the preliminary draft, published by the American Pharmaceutical Association in 1886.

As a class, there are perhaps few preparations that are more thoroughly representative of what has been designated as the decadent era in American medicine than the elixirs, and although they are not distinctly of American origin, their widespread use, and accompanying abuse, by American medical practitioners have served to connect them rather intimately with the stagnation and decline in American medicine during the earlier decades of the second half of the nineteenth century.

Half a century ago the leading medical schools of the country were endeavoring to adjust themselves to the ever increasing competition of the mushroom colleges by lowering their own standard of requirement. It is now fully fifty years since Mr. Alfred B. Taylor published a formula for an elixir of calisaya, originally a French preparation, which is generally accepted as being the forerunner of our present-day American elixirs.

Fifteen years later, in 1874, the "elixir mania," as it has frequently been called, was at its height while, simultaneously almost, the ideals and the possibilities of medical teaching, in these United States, were at their lowest ebb. A decade later, in 1884, the repeated efforts of American pharmacists to compile generally acceptable formulas for widely used poly-pharmacal preparations crystallized in the production of the New York and Brooklyn Formulary.

This Formulary was in no way original, pharmacists in other sections of the country had previously compiled collections of perhaps equal merit without meeting with the widespread recognition that was rightfully due them. The New York and Brooklyn Formulary, largely through the persistance and the initiative of Charles Rice, the Chairman of the Editing Committee, was subsequently developed as the nucleus of the National Formulary and a majority, if not all of the original 81 formulas are still retained in the present, 3rd edition, of the National Formulary.

The tenacity with which formulas have been retained, through the several editions of the latter book is suggested by the regular increase in the total number of formulas. As pointed out above the New York and Brooklyn Formulary contained a total of 81 formulas, the preliminary draft contained 414, the N. F. I 435, the N. F. II 454, and the N. F. III 501, not counting the formulas in the appendix.

More positive evidence, however, is to be found in the appended tables illustrating the continuance of the several formulas for elixirs that were included in the New York and Brooklyn Formulary.

THE ELIXIRS OF THE NEW YORK AND BROOKLYN FORMULARY.

TABLE SHOWING THE CONTINUANCE OF THE ELIXIRS OF THE NEW YORK AND BROOKLYN FORMULARY IN THE SEVERAL EDITIONS OF THE NATIONAL FORMULARY.

New York and Brooklyn Formulary Elixirs.	No.	Preliminary Draft.	N. F. I.	N. F. II.	N. F. III.
Elixir Adjuvans	1	17	25	31	U. S. P.
Elixir Ammonii Bromidi	2	20	26	32	24
Elixir Ammonii Valerianatis	3	23	27	33	25
Elixir Anisi	4	24	29	35	27
Elixir Bismuthi	5	29	32	37	29
Elixir Buchu	6	30	33	38	30
Elixir Buchu Compositum	7	31	34	39	31
Elixir Caffeinæ	8	32	36	41	33
Elixir Calcii Bromidi	9	33	37	42	34

New York and Brooklyn Formulary Elixirs	No.	Preliminary Draft.	N. F. I.	N. F. II.	N. F. III.
Elixir Calcii Hypophosphitis	10	35	38	43	35
Elixir Calcii Lactophosphatis	11	37	39	44	36
Elixir Catharticum Compositum	12	39	40	45	37
Elixir Cinchonæ	13	48	42	47	39
Elixir Cinchonæ et Ferri	14	54	45	50	41
Elixir Cinchonæ, Ferri, Bismuthi et Strychninæ	15	57	46	51	42
Elixir Cinchonæ, Ferri et Bismuthi	16	58	47	52	43
Elixir Cinchonæ, Ferri et Calcii Lactophosphatis	17	59	48	53	44
Elixir Curassao	18	63	53	58	51
Elixir Erythroxyli	19	64	55	61	48
Elixir Eucalypti	20	66	57	63	54
Elixir Euonymi	21	68	58	64	55
Elixir Ferri Hypophosphitis	22	71	59	65	56
Elixir Ferri Phosphatis, Cinchonidinæ et Strychninæ	23	74	62	68	46
Elixir Ferri Phosphatis, Quininæ et Strychninæ	24	75	63	69	U. S. P.
Elixir Ferri Pyrophosphatis	25	76	64	70	59
Elixir Frangulæ	26	84	66	72	62
Elixir Gentianæ	27	86	67	73	63
Elixir Gentianæ cum Tinctura Ferri Chloridi	28	88	69	74	64
Elixir Glycyrrhizæ	30	91	70	76	67
Elixir Grindeliæ	31	95	72	78	70
Elixir Guaranæ	32	98	73	79	71
Elixir Humuli	33	100	74	80	72
Elixir Hypophosphitum Compositum	34	101	76	82	74
Elixir Lithii Bromidi	35	103	77	83	75
Elixir Malti et Ferri	36	109	80	86	78
Elixir Pepsini	37	113	81	88	80
Elixir Pepsini et Bismuthi	38	115	83	90	82
Elixir Pepsini et Ferri	39	116	84	91	83
Elixir Phosphori	40	117	85	U. S. P.	84
Elixir Pilocarpi	41	126	88	94	87
Elixir Potassii Bromidi	42	127	91	97	90
Elixir Quininæ Compositum	43	132	92	98	See 13
Elixir Rhamni Purshianæ	44	135	95	101	97
Elixir Rubi	45	141	99	105	97
Elixir Simplex	46	U. S. P.	U. S. P.	U. S. P.	U. S. P.
Elixir Sodii Bromidi	47	146	100	106	98
Elixir Sodii Hypophosphitis	48	147	101	107	98
Elixir Stillingiæ Compositum	49	149	103	109	101
Elixir Strychninæ Valerianatis	50	150	104	110	102
Elixir Taraxaci Compositum	51	153	105	111	103
Elixir Turneræ	52	154	106	112	107
Total number of elixirs	52	142	86	86	88
Total number of formulas	81	414	435	454	501+

The perpetuation of these several formulas, either in fact or in semblance, throughout the 25 years of unprecedented progress in the sciences relating to medicine and pharmacy can only be interpreted as an indication of one of two things; unusual foresight of the compilers of the New York and Brooklyn Formulary or evident stagnation on the part of their successors in pharmacy as represented by you and me.

It is hardly possible that the editing committee of the early formulary could have foreseen that in the succeeding 25 years the medical schools of the country would develop from the deplorably low standards then existing, to the comparatively high requirements now existing at such schools as Johns Hopkins, Harvard, Cornell and Western Reserve. Nor could this editing committee have foreseen the revolution that has taken place in the treatment of disease and the accompanying appreciation of the value and the limitations of drugs.

Less than twenty-five years ago medical practitioners of all schools had an abiding faith in the specificity of drugs, and diseases were still considered as entities to be recognized and combated by the administration of suitable medicaments. During more recent decades the general fallacy of this teaching is being recognized and medical men have evolved a rational and scientific study of the action of drugs and a due appreciation of the comparatively few really valuable medicines.

An unbiased review of the titles and the composition of the several elixirs enumerated in the table above must convince the careful observer that we as pharmacists have not kept in touch with the advances made in pharmacology and drug therapy and that the National Formulary does not as it should represent the best, and only the best, that we have to offer in the drug line for the prevention as well as the treatment of disease.

In conclusion there is one point on which I wish to make myself thoroughly well understood. This communication is not in any way to be construed as being a criticism of the members of the committee on National Formulary either individually or collectively. Their work should and must be appreciated as representing the demands and desires of pharmacists at large and so far at least as the published demands go their interpretation of them cannot be questioned.

The communication is however, intended as a criticism of our own lack of development as pharmacists, of our inefficiency as scientists, of our inability to keep ourselves fully informed on the progress that is being made in other branches of the science of medicine and, above all, it is designed to call attention to the evident failure on the part of the present-day schools and colleges of pharmacy to keep the profession of pharmacy fully abreast of the progress, ideals and practices of medicine as a whole.

The Chair invited discussion upon this valuable paper.

Mr. Lindvall, of Illinois, said he thought aromatic elixir was made with three times too much aromatic spirit. He had made several experiments of this kind, by making barrelsful at a time, and he had found by using the amount of aromatic spirit directed in the Pharmacopœia that on keeping it and letting it stand for three months, then filtering it, he had enough aroma left on the filter for two more barrels.

Mr. Searby admitted the force of the criticisms in Mr. Wilbert's paper, but the question is, What are we going to do about it? Who is to blame? Who is to tear these things out of the National Formulary? Who is to say this or that elixir shall go out? A thing may be used in one section of the country that is not in use in another, and how are we going to tell about these things? They cling to them like grim death, and they cannot be gotten out of certain localities. How then are we to get them out of the National Formulary? How are we going to put Mr. Wilbert's criticism into workable shape? What are we going to do about it to make it better? We have been criticising ourselves, and justly so, for assuming to teach the doctors how and what to prescribe. But would we keep these elixirs if there were no call for them? Of course not. How are we going to get the doctors to quit prescribing them? that is the question. Will somebody enlighten us?

Mr. Wilbert said he would do that to the best of his ability. The retail druggist, under the present-day propaganda, is going out to popularize certain preparations for specific diseases. Some of the literature he had seen was rather worse than the literature sent out by the proprietary houses. He points out to the physician that such and such a preparation is good for such and such a list of diseases, instead of pointing out to him the possibility of combining certain simples that would be better than the vehicles he is using in the ordinary way. Instead of experimenting with things that the physician is using to try to hide the taste of disagreeable medicines that he wants to use, instead of giving the physician something better than the proprietary houses are offering him—in short, instead of originating—he is following blindly in many things the formulas that have been offered in the National Formulary and the pharmaceutical and drug journals; and of the two he thought the pharmaceutical and drug journals had rather the worst of it, for of all the abominations he had ever seen the formulas given there were the worst. (Applause.) "Give the physician something better than he has been using," said Mr. Wilbert, "and when you have something better do not keep it to yourselves, but give it to your brother pharmacist. Give him the same opportunity to furnish it to his physician that you have to furnish it to yours. That is the kind of work the pharmacists should do. They should improve their profession, and not attempt to teach somebody else his business."

Mr. Osseward thought that this was where the rub came in. When the druggist gets a good formula, and he finds it succeeding, he becomes jeal-

ous of it, and does not want to give that information to his brother pharmacist. For himself he said that if he had a formula that had any merit, they were all welcome to it. That spirit stimulated ethical pharmacy. "The chances are they can't make it anyhow," said Mr. Osseward.

Mr. Val. Schmidt said he had always thought that the great drawback to the National Formulary was the complexity of the formulas. It was not so much so now as in the first edition. Unfortunately, it requires from three to four other preparations to make what you want—to make another. That is one of the reasons why the National Formulary is not looked upon with so much favor as it should be. Many druggists, especially small shops cannot afford and do not feel inclined, to make all these different preparations and keep them in stock. The result is, that when they want to make a particular elixir, whatever it may be, they have got to stop and make all these in order to make the one they want. If these various formulas were simplified and brought down to a practical basis, the effect would be that each preparation could be made or kept in stock without much trouble, and the National Formulary would spring into greater favor in a much shorter time. At the next revision of the National Formulary he thought the committee should endeavor to simplify these preparations and segregate them, so that one could be made without having to make three or four others. He thought it would be a great advantage to the progress and popularity of the National Formulary.

Mr. Hallberg said the gentlemen were entirely mistaken in reference to the National Formulary on that point. There were a few elixirs in which that principle was applied, and certainly it would not be applied in any other way. There is, for example, the elixir of cinchona. That is a more complicated formula, of course, when it is made with the detannated tincture instead of the alkaloidal salts. With elixir of cinchona and iron you have to add ferric phosphate dissolved in so much water.

Then to that preparation, if it is desired, can be added strychnine and pepsin, or anything else. The Committee would not be guilty of introducing each of these formulas by itself; it would not be proper. If the gentleman referred to the original method, the original Formulary—and he believed it was still present to some extent in the second edition—the criticism was good. There were various elixirs that had to be added together in order to make one.

Mr. Hallberg concluded by saying, in answer to the queries propounded by Mr. Searby, that he hoped the report of the Committee on National Formulary would soon be presented here.

Mr. Wilbert explained that it was probably his fault that the report of the Committee on National Formulary was not forthcoming at this time. He hardly expected to attend this afternoon's session, and he turned the report over to the Chairman, who did not perhaps appreciate the importance of having it here at this time, and did not bring it with him. It was

for that reason he had urged a taking-over of the part of the afternoon's program at this session, so that the members would have more time for the discussion of that very valuable report as presented by Chairman Diehl, in connection with the forthcoming edition of the National Formulary. Mr. Wilbert went on to state that he thought it was interesting to note that the idea that prevailed with the editors of the New York and Brooklyn Formulary and the first edition of the National Formulary, which were lost sight of in succeeding years, were now being recognized again. Dr. Chas. Rice, in the introduction to the first edition of the National Formulary, explained the reasons why certain simples were introduced, so as to reduce the number of stock preparations as much as possible. He appreciated that elixirs were an objectionable class of medicine. He appreciated that fixed formulas were an objectionable thing in the administration of medicines. As Mr. Hallberg had stated, the human body is the most complicated and complex collection of cells and functions that is known. "It would be foolish to suppose that a fixed formula good for me to-day would be good for you some day next week," said Mr. Wilbert. It is that very idea that pharmacists have lost sight of entirely, and have pinned their faith to the fixed formula, losing sight of the change in medicaments given by the physician, and failing to give to the physician vehicles that would possibly hide his active medicaments, so that he might give them to his patients in an acceptable form. Pharmacists have gone the wrong track to a considerable extent, and he for one would like to see the National Formulary develop, if possible, into a collection of vehicles, and yet offer the physicians the greatest possible scope to administer some of the active medicaments, so that he could give them to his patient in acceptable form, and in dosage or strength according to the requirements of the particular case. Pharmacists who know the physical action of bromide under the present formula know, it is not a desirable form in which to present bromide. That is not the fault of the physician, nor is it the fault of the National Formulary; nor yet the fault of the Revision Committee of the National Formulary. It is the fault of the pharmacists at large. The Revision Committee for thirty years have begged the pharmacists of this country to help them, and what have they done? They have criticized every committee for what they thought they should not do: They have simply criticized, because they differed from their opinion. They have not followed it up with detail work with the physician, and have not shown him the vehicles he could use for hiding the taste and smell of certain medicaments. At the present time there are many medicaments that we cannot offer in acceptable form. For instance, many people need ergot, and an appreciable quantity of it. But who would like to take a tablespoonful of fluidextract of ergot three times a day? Viburnum is another; it is one of the worst, but one of the most useful of medicines. "There is untold work for you pharmacists, if you

will only get busy," said Mr. Wilbert. "Stir up your gray matter and do something."

Mr. Lichthardt said he had come about 600 miles to find out he was mistaken in the use of the National Formulary. He thought the N. F. was a book compiled for the purpose of giving the druggist formulas with which to run out the many hundreds and hundreds of proprietaries that were on his shelves. He had come here now to be told that it was only supposed to tell the physician how to cover up the taste of medicine. He thought it was to tell them that the preparations they were prescribing were improper, and that they should prescribe something made by a reputable pharmacist, one who would stand back of his preparation. Unless he does that, many of them will prescribe things physiologically and chemically incompatible, because he does not know how to write the prescription, and it is up to the pharmacist to tell him how.

Mr. Lloyd said Mr. Wilbert had introduced the name of Dr. Chas. Rice. He had wished to do this, but hesitated. Dr. Rice, he said, was known to the older members as a man who took hold of the old Pharmacopœia and, in connection with an able committee, made a revolution in certain directions. He based his efforts on the great work that had been done by the men who preceded him—Procter and Parrish—and those who in the days gone by had done their work so well on that book. Lingering yet were some of the actors who linked hands with the past, on the one hand, and with the present on the other. He remembered well, when at the Saratoga meeting years ago, the question came up as to whether elixirs should be admitted to the Pharmacopœia or not. Dr. Squibb was anti-elixir, and he was on the Revision Committee of the U. S. P. It was generally understood that if elixirs were admitted into the Pharmacopœia, Dr. Edward R. Squibb would resign, because he could not tolerate, as a member of the committee, a class of substances that he considered as unprofessional as he believed that class to be. And so when the committee, which had the deciding of the matter, voted to admit elixirs into that book, he did resign. Dr. Rice talked to the speaker time and time again about this matter, both at the Saratoga meeting and by correspondence. The speaker went on to say that those who attended the Pittsburg meeting would recall how Dr. Rice sat in the front seat, with other friends from New York and Brooklyn about him, wondering if the American Pharmaceutical Association would adopt the Formulary, and how delighted he was when it was accepted by the American Pharmaceutical Association. "And it has done a great work, my friends," said Mr. Lloyd. "It has done a great work. The only regret is with some of us who have one hand on the past and the other in the future, that these friends of old are not with us to-day. If Dr. Rice were here to see the work now being done, notwithstanding he would surely criticize some things we are doing now, it would be to him the delight of his life."

Mr. Wilbert said he would like to add to what Mr. Lloyd had said that pharmacists owed to no other man in America what they did to Dr. Charles Rice for his great work in connection with the National Formulary.

Mr. Sass said, as to any preparation being kept in stock, that it was the most impracticable thing to do ; the best and cheapest thing for the pharmacist to do being to stock his shelves with all the ingredients that are to go into these preparations, and when a prescription comes in to make it up fresh. Some preparations do not keep well anyhow, and he regarded this as much the better practice.

Mr. Richtmann, of Florida, said he believed he had heard more on the basic, fundamental principles of pharmacy here in the last half hour than he had heard in the entire sessions of the past. He did not know what the U. S. P. and N. F. propaganda meant, but he had never been in sympathy with it himself. He spoke of his connection some years ago with a store where they kept in touch with the individual physician, knew his wants, and and treated each prescription that came in as a new and original one, instead of pouring something out of a stock bottle. The prescription was put up under the direction of the physician to try to meet the individual case. He had visited that community since, and people who had patronized the store told him that under the present order there was a difference ; that they did not know what it was, but the medicines did not seem to be the same. Expressing his own personal view, he said he could not see the difference between pouring from the bottle of some pharmaceutical manufacturing house and pouring from a bottle of a two to five gallon preparation that the druggist himself had made. Referring to the remarks of Mr. Lloyd and Mr. Hallberg, he thought the nearer the pharmacist came to looking upon the prescriptions in the way he had indicated, the nearer he would come to practicing professional, and not commercial pharmacy.

Mr. Hallberg said it was a " condition and not a theory " that confronted the pharmacists, and there was a vast difference between making five gallons of compound syrup of hypophosphites and making one hundred Cc., or eight ounces, of the same, as called for in the prescription. There is no denying the fact that elixir of iron, quinine and strychnine phosphates is one of the most popular things ever devised, and there is no question but that it suits a great many cases. The proportions of active ingredients are pretty nearly right on the average. There are many others like it. The pharmacist cannot make as good an elixir of iron, quinine and strychnine in a small way. In the larger quantities he can take his time and let it stand, and make it perfect in color, taste and everything. This fact should be considered, and we should not run to extremes. We should remember the practical, utilitarian age we are in requires both the physician on one hand and the pharmacist, to do certain things that may not be altogether scientific but nevertheless are necessary.

Mr. Wilbert said he did not want the impression to go out that every

complex formula in the U. S. P. or National Formulary should be dispensed with, for that was impracticable and impossible. Certain things, as Mr. Hallberg has said, have their uses. The simple elixir of potassium bromide, however, has no place in the National Formulary. There might be a general formula indicating to the physician that elixir of potassium bromide may be dispensed of a certain strength. But the indications for potassium bromide are not always the same. There are hundreds of just such instances. The elixir that Mr. Hallberg has referred to, of iron, quinine and strychnine, is a very popular medicine, and is a preparation that cannot be made extemporaneously; it requires time, and if each prescription were to be made up according to that formula it would not be an economic success. The pharmacist should learn to differentiate between these things that can be made up extemporaneously and things that must be made up for stock. These are all problems that pharmacists should work out for themselves and for their physicians. Mr. Wilbert advocated work along these particular lines, and expressed the opinion that pharmacists would thereby be doing something for pharmacy, something for medicine and something for themselves.

The Chair called for the nomination of officers of the Section for the ensuing year as the next order of business.

Mr. Wilbert nominated Otto Raubenheimer, of Brooklyn, the present Secretary of the Section, for the position of Chairman, and paid testimony to his ability, conscientiousness and painstaking efforts to devise formulas for the advantage of the pharmacists of the country. Mr. Searby heartily seconded this motion.

For Secretary of the Section, Mr. Hallberg nominated E. H. Ladish, of Chicago, and this nomination was seconded by Mr. Wilbert.

Mr. Wilbert nominated W. R. White, of Nashville, for Associate on the committee, and complimented him upon the paper he had presented before the Section. Mr. Osseward seconded this motion.

On motion of Mr. Wilbert, the Section then adjourned to 8 o'clock P. M., this day.

SECOND SESSION. THURSDAY EVENING, AUGUST 19, 1909.

Chairman Seltzer called the second session of the Section on Practical Pharmacy and Dispensing to order at 8 p. m. and on motion Mr. E. H. Ladish was elected to act as secretary pro tem.

The chair requested Mr. E. G. Binz of Los Angeles to read his paper on Eucalyptus Oil, which he did as follows:

EUCALYPTUS OIL—AUSTRALIAN VS. UNITED STATES.

BY EDWARD G. BINZ, LOS ANGELES, CAL.

The eucalyptus was transplanted in California more than 30 years ago. When planted in favorable soil the tree will in 6 years attain a height of 40 feet and a circumference of 27 inches.

Malaria has unquestionably been stamped out in localities where the eucalyptus tree has been planted, and the U. S. government after careful investigation thought so well of this that they have planted the trees along the Isthmus of Panama for the same purpose. This anti-malarial feature is due to the fact that the trees are terrific water drinkers, and in a short time will dry up the swamp lands, thus destroying the breeding-places of the mosquito; some effect may also be attributed to the emanations of the eucalyptus oil in the air, the oil having a tendency to paralyze all smaller insects and destroying vegetable infusoria.

The *Eucalyptus globulus* has two kinds of leaves. The sapling leaf is short, broad and has a rounded end, is of a pale blue color, and when picked and rubbed in the hands will give those who are not familiar with the eucalyptus the idea that it is the best for making the oil. This, however, is not the case. As the leaf matures it acquires a scythe-like shape and attains a length of from six to nine inches.

The oil, in the young leaf is a *terpene* in the matured leaf a *stearoptene* (*eucalyptol*); it is easily recognized in the matured leaf being found in small globules in the outer layer of the leaf, and is present in no other part of the tree.

Nearly all the oil of *eucalyptus* in the market to-day of the commercial variety is Australian oil and is distilled from mixed varieties of *eucalypts*, which accounts for the varying percentage of the *eucalyptol* content and will assist you in determining why this oil can be sold so cheap. *Australia* has varieties of *eucalyptus* several of which will give the distiller a yield of 2 and 3 per cent. of oil for the amount of leaves handled and the *eucalyptol* in the above oils will run an average of from 60 to 70 per cent. *Eucalyptus globulus* will yield but 1 per cent. of oil and will carry about 80 to 85 per cent *eucalyptol;* the U. S. P. requires the oil to contain not less than 50 per cent. *eucalyptol* and to be devoid of *phellandrene*. The oils we get from *Australia* with but few exceptions, and they are very few, are all mixed oils of *eucalyptus* and are of uncertain strength and odor as well.

Eucalyptus globulus oil contains *eucalyptol; pinene; valerianic, butyric* and *amylic aldehydes;* traces of *acetic acid* and *methyl alcohol; resins* and *tannins*. By careful examination of the *medical records* showing the physiological experiments that have been made with the oil of *eucalyptus*, it seems to me that all of them are based on the action of the oil from *eucalyptus globulus*, and that this oil probably has been used in those experiments, in these records, where in excessive doses, death was produced, due to *aldehyde* poisoning. Other varieties of *eucalyptus*, such as used largely in Australia, do not have these *aldehydes*.

Eucalyptus oil is supposed generally, to owe its virtue to the *eucalyptol*, but my investigations have shown that the action of the oil is due to the *pinene* in the oil as well as the *eucalyptol*, both in the *internal* as well as the *external* use.

Phellandrene, which the *Pharmacopœia* refers to as objectionable is not present in the *California oil* and seems to be avoided in the oils that are usually sold from Australia. There is no doubt, that a well distilled and rectified oil of *eucalyptus globulus*, is more desirable for use than an ordinary commercially distilled oil, where no attention has been paid to kinds of leaves used, and is even better than *eucalyptol*.

A short discussion of the paper by Mr. Lichthardt and others followed, and on motion the paper was directed to take the usual course.

The next business in order being the election of officers for the ensuing year, the Chair announced the following nominees: For chairman, Otto Raubenheimer of Brooklyn, N. Y.; for secretary, E. H. Ladish of Chicago, Ill.; for associate, W. R. White, Nashville, Tenn. No further nominations being forthcoming, the secretary, on motion duly seconded, was directed to cast an affirmative vote for the candidates. This having been done, the Chair declared the nominees duly elected.

At the request of the chair, the secretary, read the paper by Mr. F. W. Nitardy entitled Manufacturing Notes on Some Official Preparations. There was no discussion and on motion the paper was referred to the committee on publication. The following is the text of the paper:

MANUFACTURING NOTES ON SOME OFFICIAL PREPARATIONS.

SYRUP OF SENEGA U. S. P.

The Pharmacopœia directs this syrup to be made by mixing 200 mils. (Cc.) of fluidextract of senega with 800 mils. (Cc.) of syrup.

Fluidextract of senega, being strongly alcoholic, does not mix clearly with the syrup and on standing the preparation becomes very unsightly from separation of resinous matter, a good part of which deposits on the sides of the bottle. If this syrup be prepared by mixing the fluidextract with water, filtering the mixture, and then dissolving the sugar in the filtrate, a much superior-appearing preparation is obtained.

I have made this syrup according to the following formula:

Fluidextract of senega	200. Mils. (Cc.)
Purified talcum	15. Gm.
Sugar	725. Gm.
Water, a sufficient quantity to make	1000 Mils. (Cc.)

Add the fluidextract to 375 mils. (Cc.) of water, then add the talcum, mix well and allow to stand for 24 hours; filter, dissolve the sugar in the filtrate by agitation or percolation and add sufficient water to make the finished product measure 1000 mils. (Cc.)

COMPOUND SOLUTION OF SODIUM PHOSPHATE, U. S. P.

This preparation when made according to pharmacopœial directions will crystallize partly on standing. The trouble is easily overcome by slightly increasing the quantity of citric acid in the preparation. I also find heating the salts on a water-bath until liquefied a time-saving and much easier process than dissolving them by trituration in a mortar as the Pharmacopœia directs. I have made this preparation for some years according to the following formula without ever having it crystallize on standing:

Sodium phosphate, in uneffloresced crystals	1000 Gm.
Sodium nitrate	40 Gm.
Citric acid	200 Gm.
Distilled water, a sufficient quantity to make	1000 mils. (Cc.)

Heat the salts in a porcelain evaporating dish on a water-bath with 25 mils. (Cc.) of distilled water until completely liquefied, then add sufficient distilled water to make the product measure 1000 mils. (Cc.) and filter.

ELIXIR OF TERPIN HYDRATE N. F.

Considerable sugar is deposited by this preparation on standing. In one case I collected the sugar that had crystallized from 4000 mils. (Cc.) and on washing it with alcohol, drying, and weighing, found that 300 Gm. had separated. By replacing a part of the syrup in this preparation with water, the crystallization of sugar is prevented. The orange flavor in this preparation seems rather weak and I believe the amount of tincture sweet orange peel added could well be doubled.

I would suggest the following formula which I have used with good results:

Terpin hydrate, powdered	17.5 Gm.	
Tincture of sweet orange peel, U. S. P.	20.	mils. (Cc.)
Solution of saccharin N. F.	61.	mils. (Cc.)
Alcohol	400.	mils. (Cc.)
Glycerin	400.	mils. (Cc.)
Syrup	75.	mils. (Cc.)
Water, a sufficient quantity to make	1000.	mils. (Cc.)

Dissolve the terpin hydrate in the alcohol, then add the tincture, glycerin, solution, syrup, and enough water to make 1000 mils. (Cc.), mix well and filter if necessary.

ELIXIR OF PARALDEHYDE, N. F.

I have experienced some trouble with this preparation in that the paraldehyde separates out, forming a preparation, consisting of two layers. A slight increase in alcohol prevents this separation if used in the making

of the preparation. It takes considerable more to effect the solution of the paraldehyde after the product is finished and has separated.

The following formula, which differs from the official one by replacing 25 mils. (Cc.) of elixir by alcohol, has proven satisfactory:

Paraldehyde	250. mils. (Cc.)
Glycerin	125. mils. (Cc).
Alcohol	340. mils. (Cc.)
Tincture of cardamom, U. S. P	17.5 mils. (Cc.)
Oil of orange	2. mils. (Cc.)
Oil of cinnamon	2. mils. (Cc.)
Compound tincture of cudbear	15. mils. (Cc.)
Aromatic elixir, a sufficient quantity to make	1000. mils. (Cc.)

Mix the ingredients in the order given and filter if necessary.

COMPOUND ELIXIR OF CORYDALIS N. F.

This elixir is made from fluidextracts and judging from the quantity of precipitate left on the filter, the bulk of the extractive matter from the fluidextracts is precipitated.

I believe a more satisfactory preparation can be produced by percolating the drugs with a suitable menstruum and making an elixir out of the percolate by the addition of syrup, glycerin, and compound spirit of orange.

I suggest the following formula to take the place of the present official one.

Corydalis, in No. 50 powder	60. Gm.
Stillingia, in No. 50 powder	60. Gm.
Xanthoxylum, in No. 50 powder	30. Gm.
Iris (Blue Flag) in No. 50 powder	90. Gm.
Potassium iodide	50. Gm.
Comp. Spirit of orange U. S. P.	7. mils. (Cc.)
Glycerin	125. mils.
Syrup	100. mils.
Alcohol.	
Water, of each a sufficient quantity to make	1000. mils.

Mix 600 mils. of alcohol with 400 mils. (Cc.) of water, mix and moisten the powdered drugs with 200 mils. of this menstruum, allow to macerate in a closed vessel for 24 hours, transfer to a cylindrical percolator, pack firmly, and percolate slowly, first with the remaining menstruum and then with water, until 750 mils. (Cc.) of percolate have been obtained. Then add the comp. spirit of orange, glycerin, syrup, potassium iodide, and enough diluted alcohol to make the finished product measure 1000. mils. (Cc.). Allow to stand for one or two days, if convenient, and filter.

The secretary next read the more important parts of the report of the

chairman of the committee on National Formulary, after which Mr. Hallberg stated that his subcommittee had prepared a list of proposed admissions and deletions,* which might perhaps be of greater interest than some other portions of the Chairman's Report because in it are mentioned the articles proposed to be dropped as well as the new articles proposed to be admitted; he also stated that one of the other subcommittees has proposed that all general preparations and processes be omitted in the next revision.

REPORT OF COMMITTEE ON THE NATIONAL FORMULARY.

PRELIMINARY REMARKS.

At the last session of the Conference of the Committee on National Formulary, at Hot Springs, the preparations of the "Formulary" having been discussed and criticized *seriatim*, assignments were made to the various sub-committees and several special committees of such preparations and general or special subjects as in the opinion of the General Committee appeared to require investigation, with a view to their correction or confirmation, and it was requested that the findings of the several committees be reported to the Chairman of the General Committee with as little delay as practicable. In compliance with this request, reports have been received as follows:

From Sub-Committee II, A. B. Stevens, Chm.—Jan. 17, 1909 and July 23, 1909.

From Sub-Committee III, C. S. N. Hallberg, Chm.—March 1, 1909 and July 24, 1909.

From Sub-Committe IV, Chas. H. LaWall, Chm.—Jan. 21, 1909.

From Sub-Committee V, H. P. Hynson, Chm.—July 6, 1909.

From Special Committee on Color Standards, H. V. Arny, Chm.—July 22, 1909.

Individual comments on the findings of the sub-committees were also received from Arny, Beringer, Dunning, Eliel, Hallberg, Raubenheimer, Scoville and Seltzer, while, in the course of correspondence, Cook, Hynson and La Wall have made valuable criticisms and suggestions, as will appear from the epitomized reports from sub-committees, with comments of the members, to follow.

It may be here stated, that the responses received from the various sub-committees cover the greater part of the subjects assigned to them, and it is believed that substantial progress has been made, notwithstanding that some of the responses were belated beyond the time when they should have been available to the sub-committees to whom the findings

* The list of proposed additions, comprising 47 articles will be found on page 1093, while the 54 proposed deletions appear in alphabetical sequence in the chairman's report, recorded on pp. 1060–1093. (The Genl. Sec'ty.)

were to be referred for further action. This is not mentioned, however, as a reproof, but rather to call attention to the difficulties that are inevitably connected with committee work, the more particularly when it is considered that this is voluntary work, undertaken in a spirit of duty and helpfulness to their associates by busy members, who, engaged in their several vocations, can perform their self-imposed tasks only by a sacrifice of their personal business, or by minimizing their time for rest and recreation. The Chairman, therefore, desires at this point to acknowledge his indebtedness to the members of the Committee for their assistance, and particularly for the promptness with which they have responded to his request (in Circular Letter No. 16, of July 10, 1909) to make their reports of progress to date, which has enabled him to make a report in time for the Annual Meeting, in accordance with the expressed intention, namely: A concise, systematized report of the findings of the sub-committees and of the comments thereon by the individual members, supplemented by the individual report of the Chairman of the General Committee, making such comments and suggestions as in his opinion are conducive to, and in furtherance of, the work of revision.

To facilitate the work of the sub-committees and avoid the repetitions of title of the N. F. preparations in correspondence, the expedient of numbering the preparations was adopted according to a simple scheme which enabled the members, though far apart, to affix identical numbers to the titles by which they may unerringly be identified. These numbers have been retained in the following reports, in which also the following abbreviations are used:

Hot Springs Conference—by "Conf er."

Sub-Committee—by the initial letters "S. C.," followed by the proper Roman numeral, as: I, II, III, IV, or V.

Names of members of the Committee—by the initial and ending letter of the surname, with a hyphen interposed, as follows:

Arny, A-y; Beringer, B-r; Cook, C-k; Diehl, D-l; Dunning, D-g; Eliel, E-l; Hall, H-l; Hallberg, H-g; Hynson, H-n; La Wall, LW (the only exception); Raubenheimer, R-r; Scoville, S-e; Seltzer, S-r; Wilbert, W-t.

EPITOMIZED REPORTS FROM SUB-COMMITTEES.

With Comments of the Members.

(Systematically arranged in accordance with the subjects.)

The preparations here follow in their numerical and alphabetical order, but include only those that were reported by the sub-committees or by the members. Of those not appearing, most of them were passed on by the General Committee as being satisfactory, while a few have not yet been reported.

A. PREPARATIONS.

2. Acid. Carbol. Iodatum.
   SC. III, 7/16/09—Change title to "Phenolum Iodatum."
5. Acid. Citric. Sacchar.
   SC. V, 7/6/09—See No. 338. "Pulveres Effervescentes."
4. Acid. Hypophosphorosum.
   SC. III, 7/16/09—Drop.
   Comments:—E-l, 7/24/09—Not used here. D-l, 8/1/09—This formula was retained as a convenience when the acid is not available.
6. Acid. Tartar. Sacchar.
   SC. V, 7/6/09—See No. 338. "Pulveres Effervescentes."
7. Aqua Sedativa.
   "Confer." Delete the word ("Codex") after "Lotio Ammoniæ Camphorata."
   SC. III, 7/16/09—Should never have been termed "Aqua;" it is a Lotion, and the dosage should be eliminated.
8. Balsamum Traumaticum.
   SC. III, 7/16/09—Drop.
   Comments:—E-l, 7/24/09—Out of date.
9. Bismuthi Oxidum Hydratum.
   "Confer." Referred to SC. IV for reconstruction of formula under title: "Magma Bismuthi Oxidi Hydrati.
   SC. IV, 1/21/09—Change title to "Bismuthi Hydroxidum." "Bismuth Hydroxide." Prepare by the following formula:

Bismuth Subnitrate	300 Gm.
Nitric Acid (U. S. P.)	500 Gm.
Ammonia Water (U. S. P.)	1680 Gm.
Sodium Bicarbonate	50 Gm.
Distilled Water, a sufficient quantity.	

Mix the Bismuth Subnitrate with 200 Cc. of Distilled Water in a liter flask, add 450 Gm. of Nitric Acid and promote the solution of the salt by agitation, and, if necessary, by a gentle heat. Pour the solution into 6000 Cc. of Distilled Water previously acidulated with 50 Gm. of Nitric Acid, and filter the liquid through cotton. Mix the Ammonia Water with 12,000 Cc. of Distilled Water in a glazed vessel of double that capacity, and pour into it, slowly and with constant stirring the Bismuth solution. Let the mixture stand during four hours so that the precipitate may subside, then pour off the supernatant liquid, and wash the precipitate four times more by decantation with Distilled Water, the Sodium Bicarbonate being dissolved in the last wash-water. Pour the precipitate upon a wetted muslin strainer, and wash it with Distilled Water, until the washings run off tasteless. Transfer the strainer to a warm place, so that the precipitate may dry. Then rub the latter to powder, and keep it in well stoppered bottles.

Note.—Bismuth Hydroxide is sometimes demanded in the form of a creamy mixture with water, under the name of *Cremor Bismuthi* or *Cream of Bismuth.* This may be prepared by triturating 20 Gm. of the Hydroxide with 80 Cc. of water.

SC. III, 7/16/09—Drop (present formula) and change title to "Mistura Bismuthi Hydroxidi."

Comments:—H-g and E-l, 7/24/09—To be substituted for present Bismuthi Oxidum Hydratum.

10. Boroglycerium.
"Confer." Delete.
SC. III, 7/16/09—Drop.
Comments:—E-l, 7/24/09—Glycerite only used here.

13. Camphor Menthol.
"Confer." Referred to SC. V for reconstruction of text.
SC. III, 7/16/09—Change title to "Menthol Camphoratum."

14. Ceratum Camphoræ Comp.
"Confer." Referred to SC. II.
SC. II, 7/23/09—No change is necessary.

15. Chloral Camphoratum.
"Confer." Referred to SC. V for revision of text.
SC. V, 7/6/09—Add to the present directions: "If large quantities are required, place the Camphor, broken into small pieces, and the powdered Hydrated Chloral in a wide mouth bottle; close the bottle with a tight fitting stopper and heat in a water bath until the mixture is liquified."
Comments:—W-t, 7/21/09—The degree of heat used thould be limited.

19. Collodium Salicylatum Comp.
SC. II, 1/17/09—Recommend the following modification of E. H. Squibb (see Bulletin, 1908, 280): Salicylic Acid, 11p.; Fluidextract Cannabis Indic. U. S. P., 10 p.; "Contractile" Collodion, q. s. 100 p.
Comments:—D-g, 7/16/09—Accept recommendation.—B-r, 7/21/09. I agree:

20. Cordiale Rubi Fructus.
"Confer."—Retain.
SC. V, 7/6/09—Formula needs no correction and is endorsed for publication.
Comments:—W-t., 7/21/09—Of doubtful utility. Prefer to see omitted.

21. Decoct. Aloes Comp.
"Confer." Refer to SC. III for deletion unless there is evidence of use.
SC. III, 7/16/09—Drop.
Comments:—E-l., 7/24/09—Not used any more.

22. Elixiria.
"Confer." Refers the subject of Adjuvant Elixirs of different alcoholic strengths to SC. IV for investigation.
SC. IV, 1/21/09—The following elixirs have been suggested in answer to the demand for low strength alcoholic elixirs, to be used especially with bromides, etc. It has not been found practicable to reduce the alcoholic strength to 5% as was at first thought possible, for, a smaller amount than has been used in the above formula will not take up sufficient of the oils and aromatics to produce the necessary flavoring. Formulas for spirits for making these elixirs will be found under their appropriate headings. (See No. 379 and after No. 385).

ELIXIR CARDAMOMI COMPOSITIUM—COMPOUND ELIXIR OF CARDAMOM.

Compound Spirit of Cardamom	20 Cc.
Alcohol	80 Cc.
Syrup	400 Cc.
Purified Talc	20 Gm.
Water, a sufficient quantity, to make	1,000 Cc.

Mix the Compound Spirit of Cardamom with the Alcohol, add the Syrup and then 500 Cc. of Distilled Water, in portions, agitating after each addition;

then add and mix the Purified Talc and filter through a carefully covered filter, returning the first portions until it is clear. Lastly, wash the filter with a mixture of one volume of Alcohol and nine volumes of Water, until the product measures 1,000 Cc.

ELIXIR VANILLINI COMPOSITUM—COMPOUND ELIXIR OF VANILLIN.

Compound Spirit of Vanillin	20 Cc.
Alcohol	80 Cc.
Glycerin	25 Cc.
Syrup	300 Cc.
Purified Talc	20 Gm.
Water, a sufficient quantity, to make	1,000 Cc.

Mix the Compound Spirit of Vanillin with the Alcohol, add the Glycerin and the Syrup and then 575 Cc. of Distilled Water in portions, agitating after each addition; then add and mix the Purified Talc, and filter, returning the first portions through a carefully covered filter until it is clear. Lastly, wash the filter with a mixture of one volume of Alcohol and nine volumes of Water, until the product measures 1,000 Cc.

SC. V, 7/6/09—Suggest that the introductory note on Elixirs be deleted. (See "Deletion of Introductory Notes" under General Subjects.)

SC. II, 7/23/09—We are opposed to changing the flavors of old established Elixirs. We therefore recommend that the Elixirs Nos. 90, 98 and 100 (of Potassium Bromide, of Sodium Bromide, and of Sodium Salicylate) be made by using an elixir prepared like the present aromatic elixir but reducing the alcohol to 8%. However, should the General Committee be in favor of changing the flavor we recommend using the compound elixir of Cardamom of SC. IV; but the compound spirit should be reduced from 20 Cc. to 5 Cc., which makes a much pleasanter elixir.

Comments:—S-e., 5/31/09—The proposed Elix. Cardam. Comp. is much too strong. Two or 2½ Cc. of the spirit per 1,000 Cc. of elixir is plenty for a good flavor, and would make a pleasant and acceptable elixir. It might be wise to color this elixir red, since there is a decided demand for colored elixirs. Instead of the new Spir. Cardmom Comp. (See No. 378), the present official spirit, with or without a little oil of Orange, could serve just as acceptably as the proposed spirit. Elixir Vanillini Comp. is still worse as regards strength. As presented this elixir contains 5 Gm. Vanillin per 1,000 Cc.—and the N. F. Tincture Vanillin Comp., which is intended as a flavoring extract, contains but 6.5 Gm. of Vanillin. The elixir made according to the proposed formula, tastes and smells strongly of Cassia, but the Vanilla flavor is so strong that it is not recognized as such, though the Vanillin irritates the throat. One Cc. of the proposed Spirit of Vanillin Compound per 1,000 Cc. of elixir is quite enough.

23. Elix. Acid. Salicyl.

"Confer." Referred to SC. III whether desirable to retain.

SC. III, 3/1/09—Dismiss, 7/16/09—Drop.

Comments:—H-g., 7/16/09—To be substituted by "Elix. Acid. Salicyl. Comp." E-l., 7/16/09—There should be an "Elix. Sodii Salicyl. Comp. B-r., 7/21/09—There is considerable call for a Compound Elixir of Salicylic Acid and a formula should be included even if the present N. F. Elixir is dismissed.

26. Elix. Ammon. Valer. et Quininæ.

"Confer." Referred to SC. III.

SC. III, 7/16/09—Drop.

Comments:—E-l., 7/16/09.—Not used here.

27. Elixir Anisi.
"Confer." Referred to SC. IV.
SC. IV, 7/6/09—Delete note. (See Nos. 306/308.)
SC. II, 7/23/09. No change (in formula) necessary.
Comments:—D-l., 8/3/09—The quantity of Oil of Fennel should be 7 minims, not 10 minims (So correct).

28. Elixir Apii Graveol. Comp.
"Confer." Referred to SC. III.
SC. III, 3/1/09—Dismiss; 7/16/09—Drop. If retained, change title to "Elixir Coca (et?) Kola Comp."
Comments:—H-g. No longer shows any demand. E-l., 7/16/09—Delete it. A-y., 7/16/09—Approve new title, if retained. B-r., 7/21/09—Dismiss.

29. Elix. Bismuthi.
"Confer." Referred to SC. II.
SC. II, 1/17/09—Recommend that no change be made.
Comments:—D-g., 7/16/09—Agree with recommendation. B-r., 7/12/09. If double salt of Bism. Sodium Tartrate is recognized (see No. 179), this should be used in reconstructed formula, to secure more flavoring.

30. Elixir Buchu.
"Confer." Retain.
SC. III, 3/1/09—Dismiss; 7/16/09—Drop.
Comments:—B-r., 7/16/09—Dismiss

31. Elix. Buchu Comp.
"Confer." Retain.
Comments:—B-r.—Can be spared.

32. Elix. Buchu et Potass. Acet.
"Confer." Retain.
Comments:—B-r., 7/21/09—Can be spared.

33. Elix. Caffeinæ.
"Confer." Retain.
Comments:—B-r., 7/21/09—Can be spared.

36. Elix. Calc. Lactophos.
"Confer." Referred to SC. II.
SC. II, 1/17/09—No change in formula, but change in directions to read: "Triturate the Calcium Lactate with 15 Cc.of Water to a creamy mixture, then add the remainder of the Water, (the) Phosphoric Acid and (the) Syrup, and triturate until dissolved. Then add enough elixir to make 1,000 Cc. and filter."
Comments:—B-r., 7/21/09—Would make this directly from soluble salt (Calcium Lactophosphate) now on market.
Will submit formula. D-g., 7/16/09—Agree with recommendation of SC. II.

37. Elix. Cathartic. Comp.
"Confer." Saccharin (2 grains in 1 fl. oz.) regarded excessive.
Referred to SC. II.
Comments:—B-r., 7/21/09—Can be spared.

38. Elix. Chloroformi Comp.
"Confer." Referred to SC. III.
SC. III, 7/16/09—Drop.
Comments:—E-l., 7/16/09—If retained, then under title "Spirit of Chloroform, Opium and Camphor, Comp." B-r., 7/21/09—Can be spared. A Misnomer. It is not an elixir.

39. Elix. Cinchonæ.
"Confer." Change title to "Elixir of Cinchona Alkaloids."
SC. II, 7/23/09—No change except to add "Alkaloidal" to the name.

40. Elix. Cinchon. et Hypophos.
"Confer." Retain.
Comments:—B-r., 7/21/09—Can be spared.

44. Elix. Cinch. Ferri, et Calc. Lactophos.
"Confer." Referred to SC. II.
SC. II, 7/23/09—Not prepared to report.

47. Elix. Cinch. Pepsini et Strychn.
"Confer." Referred to SC. II.
SC. II, 1/7/09—Add 25 Cc. of Water to the formula and change the directions to read: "Dissolve the Strychnine Sulphate in the Water and the other Alkaloidal Salts in 975 Cc. of the Elixir. Then mix the two solutions and filter if necessary."
SC. III, 3/1/09—Dismiss; 7/16/09—Drop.
Comments:—D-g., 7/16/09—Agree with recommendation of SC. II. B-r., 7/16/09—Dismiss.

48. Elix. Cocae.
"Confer." Retain.
Comments:—B-r., 7/21/09—Can be spared.

49. Elix. Cocæ et Guaranæ.
"Confer." Retain.
Comments:—B-r., 7/21/09—Can be spared.

51. Elix Curassao.
"Confer." Referred to SC. IV.
SC. IV, 1/21/09—Recommend the following formula, which is based upon an analysis of the continental Elixir of Curacao, and has been used satisfactorily for a number of years:

ELIXIR CURASSAO—ELIXIR OF CURACAO.

Oil of Bitter Orange Peel	3.00 Cc.
Oil of Fennel	0.05 Cc.
Spirit of Bitter Almond	0.20 Cc.
Orris Root	6.00 Gm.
Tincture of Sweet Orange Peel	15.00 Cc.
Stronger Orange Flower Water	20.00 Cc.
Alcohol	300.00 Cc.
Syrup	400.00 Cc.
Purified Talc	20.00 Gm.
Water, a sufficient quantity, to make	1,000.00 Cc.

Dissolve the Oils in the Alcohol, add the Spirit of Bitter Almond, the Tincture of Sweet Orange Peel and the Orris Root, and then the Stronger Orange Flower Water and allow this mixture to stand with occasional shaking for 24 hours. Add the Syrup and the Water, in portions, with agitation after each addition; then add and mix the Purified Talc, filter through a carefully covered filter, returning the first portion until it filters clear. Lastly, wash the filter with sufficient of a mixture of Alcohol 3 volumes and Water 7 volumes, until the product measures 1,000 Cc.

A note should be included in the preface of the N. F. that where small quantities of volatile oils are to be measured, dilutions should be made and an accurate measurement obtained by usng this dilution (See No. 381 "Spirit of Volatile

Oils"). "The Spirit of Curacao. now in the N. F. should be omitted if this formula is accepted."

Comments:—S-e., 5/31/09—Proposed formula may only be criticized as a matter of personal taste. Should prefer omission of Orris Root, which is very noticeable in the finished elixir. Would add a little Citric Acid, and would reduce the oil combination—which is very good—by about 33% as an improvement of the present formula.

52. Elix. Digestivum Comp.

"Confer."—Referred to SC. IV.

SC. IV., 1/21/09—"A confirmation of the statement of inactivity of this preparation, made by the Council Pharmacy and Chemistry of the Amer. Med. Assoc., was obtained through experimental work. On account of the widespread use of this elixir we would recommend its retention. Pharmaceutically it is satisfactory, except as regards the uniformity of color. In this connection, we would say that it is the experience of the sub-committee that a more uniform coloring effect can be obtained by the use of Cudbear in powder, macerated for a stated period, than from the use of the tincture as now recommended. We would suggest, therefore, that 1 Gm. of powdered Cudbear be substituted for 15 Cc. of the tincture, and that it be allowed to stand for 24 hours with frequent agitation, before filtering.

SC. III, 7/16/09—Change title to "Elixir Pepsini Comp."

Comments:—H-n., 10/6/09—Tentatively suggests a formula in which both pancreatin and Diastase are omitted. Suggests change of title to "Elix. Pepsini Comp." S-e., 2/27/09—The question which is bothering the A. M. A. can be settled by simply dropping Pancreatin and Diastase from the formula. These are in no way essential in the elixir, which, as we all know, is used more as a vehicle than as a digestive agent. B-r., 7/21/09—Submits a paper on (Comp. Powder of Pepsin and) Comp. Elixir of Pepsin, which may be consulted in Amer. Journ. Pharm., July 1909, 331.

54. Elix. Eucalypti.

"Confer."—Formula satisfactory.

Comments:—B-r., 7/21/09—Can be spared.

55. Elix. Euonymi.

"Confer."—Referred to SC. IV.

Comments:—B-r., 7/21/09—Can be spared.

60. Elix. Ferri Pyrophos., Quininæ et Strychn.

"Confer."—Referred to SC. V. (This possibly refers to No. 61 D-l.)

61. Elixir Ferri et Strychn.

"Confer."—Retain (this possibly is intended for No. 60 D-l.).

SC. II, 1/17/09—The use of Tincture of Citro-Chloride of Iron made by the proposed modified formula (See No. 452) overcomes the tendency of this elixir to precipitate.

62. Elix. Frangulæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—No change necessary.

Comments:—B-r., 7/21/09—Can be spared.

63. Elix. Gentianæ.

"Confer."—Referred to SC. IV.

SC. II, 1/17/09—Recommends increase of material used for detannating, as suggested by E. H. Squibb (Bulletin, 1908, 280).

SC. IV, 1/21/09—Recommends the following formula, which has that advantage over the one now in the N. F., first, that it is much stronger

in Gentian flavor, the detannating in the former process removing, with the tannin, much of the bitter principle; second, the preparation, may be made quickly and easily, and has all the advantages of the detannated elixir.

Fluidextract of Gentian	35 Cc.
Compound Spirit of Cardamom	15 Cc.
Sodium Citrate	30 Gm.
Glycerin	50 Cc.
Syrup	250 Cc.
Alcohol	200 Cc.
Purified Talc	20 Gm.
Water, a sufficient quantity to make	1,000 Cc.

Dissolve the Sodium Citrate in 350 Cc. of Water, add this solution to the Alcohol with which the Compound Spirit of Cardamom has been mixed then add the Fluidextract of Gentian, the Syrup, the Glycerin, and enough Water to make the product measure 1,000 Cc. Add and mix the Purified Talc and filter through a covered filter, returning the first portions of the filtrate until clear. Lastly, wash the filter with a mixture of 2 volumes of Alcohol and 9 volumes of Water until the product measures 1,000 Cc.

Comments:—D-g., 7/16/09—Agrees to the recommendation of SC. II, B-r., 7/21/09—Cannot concur in the recommendation of SC. II.

64. Elix. Gentian with Tinct. Ferric Chloride.

65. Elix. Gentian and Ferric Phosphate.

"Confer."—Both referred to SC. V.

SC. IV, 1/21/09—No change in the formula of these two elixirs as now in the N. F., the new Elixir of Gentian (see No. 63); however, to be used. Change "Chloride of Iron" in the title to "Ferric Chloride," and "Phosphate of Iron" to Ferric Phosphate."

66. Elix. Gentian Glycerinatum.

"Confer."—Referred to SC. II. Contains excessive Saccharin.

SC. II, 7/23/09—Increase the fluidextract of Gentian to 20 Cc. and omit the Saccharin (Solution).

Comments:—D-l., 8/3/09—On line 2 and 5 of formula, the Apothecaries quantities must be corrected from 240 minims, to 225 minims.

67. Elix. Glycyrrhizæ.

"Confer."—Referred to SC. III.

69. Elix. Glycerophosphatum.

"Conf."—Referred to SC. II.

SC. II, 1/17/09—Recommends the modification suggested by E. H. Squibb (See "Bulletin," 1908, 281), viz. "To insure permanent solution, increase the phosphoric acid from 8 Gm. to 10 Gm. No other change throughout the formula." 7/23/09—Since reporting in favor of Squibb's formula it has been found that similar preparations on the market are twice as strong. Therefore, now recommend: double the amount of Sodium and Calcim Glycerophosphates, and the use of 15 Gm. of Lactic Acid in place of the Phosphoric Acid; also, use 100 Cc. of Angelica Wine in place of an equal amount of Aromatic Elixir.

Comments:—D-g. 7/16/09.—Referring to SC. II. 1/17/09. Favor the use of 4 Cc. (or less) of Lactic Acid in place of 10 Gm. of Phosphoric Acid. The latter acid will decompose a large portion of the Glycerophosphoric Acid, pre-

sumably hydrolizing it to Glycerin and Phosphoric Acid. Lactic Acid is believed to act much in the same way with glycerophosphates as it does with normal phosphates, that is combining and causing solution. B-r. 7/21/09—Do not agree with Squibb's recommendation. Lactic Acid is far better than Phosphoric Acid in my experience. The title of this Elixir should be changed to "Elix. Calc. and Sodium Glycerophosphates," and a new elixir, that is very much used with us, introduced under the title "Compound Elixir of Glycerophosphates.

70. Elixir Grindeliæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—No change in formula, but believe that the deposit which is sometimes formed may be prevented by the addition of a small quantity of Borax to the Comp. Elix. Taraxacum.

Comments:—S-s. 7/23/09—Will try this when I return to the States.—B-r 7/21/09—Can be spared.

71. Elixir Guaranæ.

"Confer."—Referred to SC. II

SC. II, 7/23/09—Same findings as under No. 70, which see.

72. Elixir Humuli.

"Confer."—Satisfactory.

Comments:—B-r, 7/21/09—Can be spared.

74. Elixir Hypophos. cum Ferro.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Change as follows:

Calcium Hyphosphite	17.5 Gm.
Sodium Hypophosphite	17.5 Gm.
Potassium Hypophosphite	8.75 Gm.
Ferric Hypophosphite	8.75 G.m
Potassium Citrate	11.00 Gm.
Lactic Acid	4.00 Cc.
Water	250.00 Cc.
Syrup	250.00 Cc.
Aromatic Elixir	Q. S.

Triturate the Ferric Hypophoshite with 50 Cc. of water to a perfectly smooth mixture, then add the Potassium Citrate and heat gently until dissolved; then add the Syrup. Dissolve the other Hypophosphites in the remaining water and mix the two solutions; then add the acid and sufficient Aromatic Elixir to make 1,000 Cc.

78. Elixir Malti et Ferri.

"Confer."—Satisfactory.

Comments:—B-r, 7/21/09—Can be spared.

79. Elixir Paraldehydi.

"Confer."—Referred to SC. III.

SC. II, 1/17/09—Recommends the suggestion of E. H. Squibb ("Bulletin," 1908, 281), to "increase the Alcohol from 315 Cc. to 330 Cc. This is the only change called for."

SC. III, 3/1/09—Dismiss; 7/16/09—Drop.

Comments:—D-g, 7/16/09—Agree to recommendation of SC. II. B-r, 7/21/09—Is not called for—should be dismissed. D-l, 8/3/09—The slight increase in Alcohol, recommended by SC. II, will prevent the separation during very cold weather into two layers.

It should *not* be dismissed.

81. Elix. Pepsini Bism. et Strychn.
"Confer."—Referred to Sc. II.

82. Elixir Pepsini et Bismuthi.
"Confer." Referred to SC. II.
SC. II, 1/17/09—In the first line of directions, after the word "Glycerin," insert "and if decidedly acid, nearly neutralize with Sodium Hydroxide solution.

Comments:—D-g, 7/16/09—Agree with the recommendation, but suggest that the word "decidedly" be left out.

86. Elix. Picis Compositum.
"Confer."—Referred to SC. III.
SC. III, 3/1/09—Dismiss: 7/16/09—Drop.

Comments:—E-l, 7/16/09—If retained, the title should show the presence of Morphine.—B-r, 7/21/09—Dismiss.

87. Elixir Pilocarpi.
"Confer."—Referred to SC. II.
Comments:—B-r, 7/21/09—Can be spared.

90. Elix. Potass. Brom.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Oppose change of flavor. See No. 22.

91. Elixir Quininæ et Phosphat. Comp.
"Confer."—Referred to SC. III.
SC. III, 3/1/09—Dismiss; 7/16/09—Drop.
Comments:—B-r—7/21/09—Dismiss.

95. Elix. Rhei.
"Confer."—Satisfactory.
Comments:—B-r—Can be spared.

96. Elix. Rhei et Magnes. Acet.
"Confer."—Satisfactory.
Comments:—B-r, 7/21/09—Can be spared

97. Elix. Rubi Comp.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Unable to obtain recently obtained Blackberry Juice at the time of experiment and do not recommend increasing the alcoholic strength sufficient to prevent fermentation. Chloroform or other preservatives might be added, but some of us doubt the advisability of creating a formula of this character.

Comments:—B-r., 7/21/09—Can be spared. D-l., 8/3/09—Experiments are being made to determine a reliable method for preserving the juice.

98. Elixir Sodii Brom.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Oppose change of flavor in old established elixirs. (See No. 22.)

100. Elixir Sodii Salicyl.
"Confer."—Referred to SC. II.
SC. II, 7/23/09 Oppose change of flavor. (See No. 22.)
Comments:—B-r., 7/21/09—Can be spared.

101. Elixir Stillingiæ Comp.
"Confer."—Satisfactory.
Comments:—B-r., 7/21/09—Can be spared

103 Elix. Taraxaci Comp.

"Confer."—Referred to SC. IV.

SC. IV, 1/21/09—"This formula has been giving satisfaction to the majority of druggists and has been widely copied. Its retention as now in the N. F. is therefore recommended."

Comment:—S-s.,7/23/09—See modification proposed under Nos.70 and 71.

104. Elixir Terpini Hydratis.

"Confer."—Referred to SC. II.

SC. II, 1/17/09—Recommends modification proposed by E. H. Squibb ("Bulletin," 1908, 280), which consists in increasing the Alcohol from 400 Cc. to 436 Cc., and, omitting the Syrup, using Glycerin only to make the volume up to 1,000 Cc. This overcomes the tendency to separate out Terpinhydrate when exposed to a low temperature.

Comments:—D-g., 7/16/09—Believes it an error to suppose that it is the Terpinhydrate that crystallizes out when the elixir is made by the N. F. formula. In his experience, it is the Sugar. Suggests increase of Alcohol (to 425 Cc.), and the replacement of one-half the Syrup by Water, or to adopt the following formula which has been used with entire satisfaction for about five years:

Terpinhydrate, 256 gr.; Glycerin, 6 fl. ozs.; Syrup, 6 fl. ozs, Water, 4 fl. ozs.; Alcohol, 16 fl. ozs.; Oil of Orange, 24 drops.

B-r., 7/21/09—Needs reconstruction; would eliminate Saccharin and improve the flavoring. "This applies to No. 105 and No. 106 also."

105 Elixir Terpini Hydrat. c. Codeina.

"Confer."—Referred to SC. II.

SC. II, 1/17/09—Covered by recommendation under No. 104.

106. Elixir Terpini Hydrat. c. Heroina.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Change word "Heroina (Heroine)" in the title to "Acetyl-Morphina (Acetyl-Morphine)."

SC. II, 1/17/09—See No. 104.

107. Elixir Turneræ.

"Confer."—Satisfactory.

Comments:—B-r., 7/21/09—Can be spared.

110. Emplast. Aromat.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Omit entirely and substitute the following formula in its proper place:

"Cataplasma Aromatica."—Spice Poultice—Spice Bag

Powdered Capsicum	25 parts.
Powdered Cinnamon (Saigon or Ceylon?)	25 parts.
Powdered Cloves	25 parts.
Powdered Ginger	25 parts.

When needed for use, place about 100 Gm. in a thin muslin bag, about 10Cm x 15 Cm., steep in warm brandy or diluted alcohol, and apply.

Comments:—W-t., 7/21/09—The suggestion is good. B-r., 7/21/09—In use—"100 Gm" is the least; twice the amount is needed for application which is usually made to abdomen of child; a "flat" muslin bag is intended; instead of steeping in "brandy" suggest warm whisky, diluted alcohol, or warm vinegar.

111. Emplast. Fuscum Camphorat.

"Confer."—Referred to SC. V—Delete note.

SC. III, 7/16/09—Listed under preparations to be dropped or modified.

Comments:—E-l. 7/16/09—Drop note.

113. Emulsa.
"Confer."—The entire subject of Emulsions for Nos. 113/128 is referred to SC. II.
SC. II, 7/23/09—After numerous experiment arrived at the following conclusion:—50% Emulsions do not separate as quickly as 40% Emulsions: Alcohol is not necessary as a preservative for Emulsions that are to be kept for a few weeks. However, the addition of 10% of Alcohol does help to prevent the separation and makes a more fluid Emulsion. If Emulsions are kept for some time, Alcohol or a small quantity of Chloroform will prevent fermentation. 40% Emulsions when separated are easily mixed by agitation and have the advantage of being more fluid. The Sub-Committee submits the questions of reduction to 40% Cod Liver Oil in Emulsions, and the use of Alcohol or Chloroform as preservatives, to the General Committee.
SC. V, 7/6/09—In accordance with the views expressed under No. 306 to No. 308 (which see), recommend deletion of the introductory remarks (No. 113).

114. Emulsa Symbolica.
SC. V, 7/6/09—For the same reason as under No. 113, the introductory remarks are recommended for deletion.

115. 1. Acacia Emulsion of Cod Liver Oil.
SC. V, 7/6/09—Delete note.

116. 2. Irish Moss Emulsion of Cod Liver Oil.
SC. II, 7/23/09—Delete.

118. 4. Dextrin Emulsion of Cod Liver Oil.
SC. II, 7/23/09—Delete.

119. 5. Emulsions of Volatile Oils.
SC. V, 7/6/09—Delete (See No. 306 to No. 308.)

127. Emulsum Petrolei.
SC. III, 7/16/09—Change title to "Emulsum Petrolatum."
SC. II, 7/23/09—Use Yellow Petrolatum and increase the amount to 250 Gm. Use granulated Acacia instead of powdered and increase to 100 Gm. In the second line of directions increase the water to 250 Cc.

128. Emulsum Phosphaticum.
SC. III, 7/16/09—Change title to "Emulsum Olei Morrhuæ Phosphaticum."
SC. II, 7/23/09—No change unless Wine is used in place of Jamaica Rum, which some of us think advisable. Let the General Committee decide.
Comments:—D-l., 8/5/09—On line 2 of formula, after Glyc. of Yolk of Eggs, correct quantity to 165 Cc., not 165 Gm. (and the word "Fluidounce" to the plural = fluidounces).

129. Essentia Pepsini.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—See no need of change, but do not object to increase the Glycerin to 200 Cc.
SC. III, 7/16/09—Change title to "Liquor Pepsini et Rennini."
Comments:—H-g., 7/16/09—The title Renninum has been proposed for Rennet. E-l., 7/16/09—Direct the use of detannated wine.

131. Extr. Glycyrrhizæ Depur.
"Confer."—Referred to SC. III.
SC. III, 3/1/09—Dismiss; 7/21/09.—Drop.
Comments:—B-r., 7/21/09—Dismiss.

132. Ferri Hypophosphis.
"Confer."—Delete.
SC. III, 7/16/09—Drop.
Comments:—D-l., 8/5/09—This formula was retained for the convenient preparation of Ferric Hypophosphite when not obtainable on the market.

133-177. Fluidextracts.
"Confer."—Entire subject referred to SC. III and their findings to SC. IV.

133. Fluidextracta.
SC. V, 7/6/09—Delete (all after Fluidextracts and before "General Process")—See No. 306 to No. 308.

142. Fluidextractum Apii Graveolentis.
SC. III, 7/16/09—Change title to "Fluidextractum Graveolentis."
Comment:—H-g., 7/16/09—Eliminate the treacherous "Apii" if this is retained.

147. Fluidextract. Calendulæ.
Comments:—B-r., 7/21/09—Referring to a criticism on this fluidextract in Circular Letter No. 15, his own experience proves conclusively that the menstruum directed in the N. F. (Alcohol, 2 vols., Water 1 vol.) is *not* satisfactory. Has used Alcohol with satisfaction. The U. S. P. directs Alcohol as the menstruum for Tinct. of Calendula. Questions whether the recommendation of 9 vols. Alcohol and 11 vols. Water as menstruum is not an error of the typewriter, and that 1 vol. Water, not 11 vols., is meant. D-l., 8/5/09—The very clear typewritten criticism referred to in Circular Letter No. 15, says: Alcohol, 9 vols; Water, 11 vols.

148. Fluidextr. Camelliæ.
SC. III, 7/16/09—Change title to "Fluidextractum Theæ."
Comments:—H-g., 7/16/09—The title "Camelliæ" has never been accepted and may as well be substituted by the older one—"Theæ."

151. Fluidextr. Coffeæ Viridis.
SC. III, 7/16/09—Drop.
Comments:—H-g., 7/16/09—Never used.

152. Fluidextr. Convallariæ.
Comments:—D-l., 8/5/09—The Latin title should be extended by the word "Florum."

169. Fluidextr. Rhamni Pursh. Alkalinum.
SC. III, 7/16/09—Drop.
SC. II, 7/23/09—Add 100 Cc. of Alcohol to the formula and in the 4th line from the bottom change 750 to 600 and after the word "Oil' in the 3rd. line from bottom insert "previously dissolved in the Alcohol.
Comments:—H-g., 7/16/09—No need of it. The Fluidextract of Rhamni Pursh. Arom., U. S. P. is sufficient. S-e., 2/27/09—Often becomes mouldy. A small amount of Alcohol (5 to 10%) is needed to prevent this, and this addition should be made.

170. Fluidextr. Sterculiæ.
SC. III, 7/16/09—Change title to "Fluidextractum Kolæ."
SC. II, 7/23/09—In menstruum I change to 624 Cc. Alcohol and 312 Cc. Water. Menstruum II change to Alcohol 2 vols., Water 1 vol. (See Circular Letter No. 14.)
Comments:—S-e., 2/27/09—The menstruum is too weak to insure a permanent preparation—the fluidextract precipitating progressively. Recommends Alcohol 2 vols., Water 1 vol. H-g., 7/16/09—The title "Sterculia" has never been accepted and may be substituted by the older one—"Kola."

179. Glyceritum Bismuthi.

"Confer."—Satisfactory.

SC. II, 1/17/09—Recommends the dilution of the magna, produced according to directions, with 5,000 Cc. instead of 1,000 Cc. of Distilled Water, to insure complete precipitation of Bismuth, as suggested by E. H. Squibb ("Bulletin," 1908, 280). No other modification of working direction is necessary, except to insert the word "previously" after the word acid in the 1st line.

Comments:—D-g., 7/16/09—Agree to recommendation. B-r., 7/21/09. Have had this under consideration. Recommend its preparation from the double salt. Bismuth-Sodium Tartrate, which is believed to be available on the market. The average retailer is not well situated to make Bismuth salts.

180. Glyceritum Guaiaci.

"Confer."—Satisfactory.

Comments:—D-l, 8/5/09—The proportions should be corrected in accordance with the original formula of T. L. Hilton, who recommended its addition in 1893 (See Proceedings, 1893, 43), which is as follows: Guaiac, powdered, 640 grains; Liquor Potassæ, U. S. P., 1 fl. oz.; Glycerin, 9 fl. ozs.; Water, q. s. 16 fl. ozs.

189. Gossypium Stypticum.

"Confer."—Referred to SC. II.

SC. II, 1/17/09—"In the second line of the directions increase the quantity of water to 14 parts, and in the fifth line change the last word from "twice" to "three times."

Comments:—D-g, 7/16/09—Iron solution should contain Alcohol; makes light, fluffier cotton. Suggest following formula which experience proves satisfactory: Sol Ferric Chloride, U. S. P. 100 Cc.; Glycerin, 30 Cc.; Alcohol, 200 Cc.; Cotton, 100 Gm.—Saturate the Cotton with this solution and press out to weigh 300 Gm.

192. Iodoformum Aromatisatum.

"Confer."—Delete synonym "Deodorized Iodoform." Referred to SC. V.

SC. III, 7/16/09—Mentions in list of articles to be dropped or modified.

194. Lac Humanisatum.

"Confer."—Dismiss.

SC. III, 7/16/09—Drop.

Comments:—E-l, 7/16/09—Hardly to be considered as a pharmaceutical product.

197. Linimentum Iodi.

"Confer."—Satisfactory.

SC. III, 7/16/09—Listed among preparations to be dropped or modified.

SC. II, 7/23/09—Increase the Glycerin to 50 Cc. and change directions to read: Dissolve the Potassium Iodide in the Water then add the Iodine and when dissolved add the Glycerin and enough Alcohol to make 1,000 Cc.

Comments:—E-l, 7/16/09—Composition.

198. Linimentum Opii Comp.

"Confer."—Formula satisfactory, but *omit note.*

SC. II, 7/23/09—Change the *note*, beginning after the word "by" on the second line, to read: "Mixing 50 to 60 Cc. of fresh egg-albumen (whites of two eggs) with the Ammonia Water, then shake this well with the Oil of Turpintine and add this emulsion to the other ingrediants."

199. Linimentum Saponato-Camphoratum.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Use Dunning's formula given in the "Proceedings" 1907, 130.

200. Linimentum Terebinth. Acet.
"Confer."—Satisfactory.
SC. II, 7/23/09—Change formula as follows:
Oil of Turpentine, 200 Cc.; Oil of Lemon, 8 Cc.; Acetic Acid, 40 Cc.; Rose Water, 170 Cc.; Fresh Eggs, q. s. Triturate the content of one egg and the yolk of another with the Oil of Turpentine, etc., etc.

203. Liquor Alumini Acet.
"Confer."—Delete note.
SC. III, 7/16/09—Modify, else drop.
SC. II, 7/23/09—No change necessary.

Comments:—E-l, 7/16/09—"et Calc. Acetatis" (?). D-l, 8/5/09—Gruning in Pharm. Ztg. (1909, No. 44, 434) attributes the instability of this solution to the presence of Calcium Sulphate. Recommends its removal by means of Barium Acetate, and any excess of the latter by a little Aluminum Sulphate (See Rep. on Progr. of Pharm. 1909).

204. Liquor Alumini Acetico-Tartratis.
"Confer."—Satisfactory.
SC. V, 7/16/09—Delete note (See No. 306 to No. 308).
SC. II, 7/23/09—Use an equivalent amount of Monohydrated Sodium Carbonate in place of $Na_2C0_3 10H_20$.

205. Liquor Ammon. Acet. Conc.
"Confer."—Delete.
SC. III, 7/16/09—Drop.

206. Liquor Ammon Citrat. Fort.
"Confer."—Formula requires correction.
SC. III, 7/16/09—Modify, else drop.
SC. II, 7/23/09—The stronger solution not needed; but to make the strength the same as the B. P. by changing the amount of Citric Acid to 125 Gm. Then omit the words "Fortior" and "Stronger" in the titles. Change the last paragraph to read "4.0 Cc. contain about 0.57 Gm. of Ammonia Citrate."

Comments:—E-l, 7/16/09—Delete; Always should be freshly prepared. D-l, 8/5/09—Believe it a mistake to dismiss the "Stronger" Solution. It keeps perfectly, and is very convenient for quickly making preparations in which Ammonia Citrate is required. The correction required is in the quantity of Citric Acid, which should be 625 Gm., *not* 560 Gm. This correction will make it 5 times the strength of the B. P. preparation, by volume.

207. Liquor Antigerminarius.
SC. V, 7/6/09—If retained the title should be changed to "Spiritus Thymolis Compositus, Compound Spirit of Thymol." It is not used. Better delete.
SC. III, 7/16/09—Drop.

Comments:—H-g, 7/16/09—Never any use or demand. W-t, 7/21/09—Would favor to omit this from the Formulary. B-r, 7/21/09—Apparently no use for this. Should be dismissed and *not* retained under a new title. R-r, 7/28/09—Should be omitted. In my experience not prescribed or used to any extent.

208. Liquor Antisepticus Alkal.
"Confer."—Referred to SC. II.
SC. II, 1/17/09—Change the quantity of Sodium Benzotae to 8 Gm. and Sodium Borate to 32 Gm. Use powdered Cudbear, 2 Gm., instead of the tincture, and add O. 5 Gm. of Oil of Pinus Pumilio.

Comments:—D-g., 7/16/09—Approve the recommendation. B-r., 7/21/09—Approve, except introduction of Oil of Pinus Pumilio, which would decidedly change flavor to undesirable harshness. R-r., 7/28/09—Object to the addition of Oil of Pinus Pumilio, as this will be another *charge of piracy* to be preferred against the N. F.

209. Liquor Auri et Arseni Bromidi.
"Confer."—Satisfactory.
SC. V., 7/6/09—Add:—"Caution! If a fume chamber is not accessible, the disagreeable and injurious effects of the Bromine upon the exposed mucous membrane of the operator may be largely prevented by placing around him several shallow vessels containing a weak solution of Ammonia." Delete note (See No. 306 to No. 308).
Comments:—B-r., 7/21/09—"Bromine Water," not Bromine, is directed and in small quantities and that can be safely handled.

211. Liquor Bromi.
"Confer."—Formula Satisfactory.
SC. V, 7/6/09—Add to present note the "Caution" suggested for No. 209.

212. Liquor Calcis Sulphuratæ.
"Confer."—Satisfactory.
SC. V., 7/6/09—In formula, for "Lime, Freshly slaked," say Calcium Hydroxide, freshly prepared," and for first sentence of the present process, substitute: "Mix the freshly prepared Calcium Hydroxide with the Sulphur and to these gradually add 1,750 Cc. of boiling water."

Comments:—W-t., 7/21/09—Calcium Hydroxide is not a proper designation for "Slaked Lime." Lime as ordinarily found is not pure Calcium Oxide and the use of a chemically pure Calcium Oxide would be out of question. B-r., 7/21/09—"Lime" has official sanction—see "Calx" and "Liquor Calcis," U. S. P., in both of which "Lime" is directed.

215. Liquor Electropœicus.
"Confer."—Eliminate.
SC. III, 7/16/09—Drop.

216. Liquor Extr. Glycyrrhizæ.
"Confer."—Eliminate.
SC. III, 7/16/09—Drop.

217. Liquor Ferri Albuminati.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—We recommend the adoption of Squibb's formula as given in the A. Ph. A. Bulletin (1908) p. 280—but use fresh egg albumen instead of dried—using 7.5 times the amount.

218. Liquor Ferri Hypophosph.
"Confer."—Prefer alternative formula. Referred to SC. II.
SC. II., 1/17/09—Omit the first formula.
Commnets:—D-g., 7/16/09—Approve recommendation.

219. Liquor Ferri Iodidi.
"Confer."—Satisfactory.
SC. II, 7/23/09—Change the first sentence of the note to read: "This

solution contains about 81 Gm. of Ferrous Iodide in 100 Cc. or 49.65%.
D-l., 8/6/09—The percentage (49.65%) should be omitted. It conflicts with rule adopted. (See recommendation No. 7, p. 493, "Proceedings," 1908.)

220. Liquor Ferri Oxychloridi.
"Confer"—Referred to SC. II.
SC. II, 1/17/09—Recommends the modified formula suggested by E. H. Squibb ("Bulletin," 1908, 281), which directs: Solution of Iron Tersulphate, 350 Gm.; Sodium Hydroxide, 146 Gm.; Granulated Sugar, 28 Gm.; Hydrochloric Acid, 35 Gm.; Distilled Water, q. s. 1,000 Gm.
SC. III, 7/16/09—Listed with preparations to be droped or modified.
Comments:—D-g., 7/16/09—Will try the modified formula. The N. F. formula not satisafctory, particularly when used for making Liq. Ferri Pepton, etc. B-r., 7/21/09—Favor retention of present N. F. formula which is that of the B. P. with such minor changes as are necessitated by differences in ingredients. It is satisfactory and should be retained as a basis for other perparations generally of foreign origin.

222. Liquor Ferri Peptonati.
"Confer"—Referred to SC. II.
SC. II, 7/23/09—Not prepared to report.

223. Liquor Ferri Peptonati c. Mangano.
"Confer"—Referred to SC. II.
SC. II, 1/17/09—Not prepared to report.

227. Liquor Hypophosph. Comp.
"Confer"—Referred to SC. II.
SC. II, 7/16/09—Increase the Glycerin to 350 Cc.
Comments:—D-g., 7/16/09—Favor the addition of small percentage (10%) of Alcohol, to prevent fungous growth, rather than to increase Glycerin.

228. Liquor Iodi Carbolatus.
"Confer"—Correct Nomenclature.
SC. III, 7/16/09—Change title to "Liquor Iodi Phenolatus."
Comments:—D-l., 8/6/09—Carbolic Acid in formula to "Phenol."

229. Liquor Magnesii Bromidi.
"Confer"—Delete.
SC. III, 7/16/09—Drop.

232. Liquor Morphinæ Citratis.
"Confer"—Referred to SC. III.
SC. III, 3/1/09—Dismiss. 7/16/09—Drop.
Comments:—B-r., 7/21/09—Dismiss.

233. Liquor Morphinæ Hypoderm.
"Confer."—Referred to SC. III.
SC. III, 3/1/09—Dismiss. 7/16/09—Drop.
Comments:—B-r, 7/21/09—Dismiss.

234. Liquor Pancreaticus.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Increase the Alcohol to 65 Cc., use Magnesium Carbonate in place of Talc, and finally add 5 Gm. of Sodium Chloride and 2 Cc. of Chloroform to 1,000 Cc. of the liquor. This not only preserves the solution but improves the taste.

236. Liquor Pepsini Aromaticus.
"Confer"—Referred to SC. II.

237. Liquor Phosphatum Acidus.

"Confer."—Referred to SC. II. Compare Shinn's formula.

SC. II, 7/23/09—If pure White Bone-ash is used no change is necessary.

238. Liquor Phosphori.

"Confer."—Referred to SC. V.—Question of manipulation.

SC. V, 7/6/09—Instead of first paragraph of present process, use part of the directions for making Spirit of Phosphorus, amended to read: "Weigh the Phosphorus in a capsule containing water which should be counter balanced after each weighing, dry it carefully and quickly with blotting paper and introduce it a flask containing the absolute Alcohol. Into the neck of the flask insert a perforated cork stopper bearing a long (about 50 Gm.) glass tube to serve as a condenser. Place the flask in a water bath and heat, so that the Alcohol may be kept gently boiling, until the Phosphorus is dissolved. Allow to cool and then add sufficient absolute Alcohol to make 100 Cc. (?): Delete 2nd paragraph of note (see No. 306, to No. 308).

Comments:—B-r, 7/21/09—Diameter of glass tube should be stated about —— to——mm. Also add the other ingredients before absolute "Alcohol q. s." (100 Cc). W-t, 7/21/09—Is this sufficiently popular to warrant its retention?

239. Liquor Picis Alkalinus.

"Confer."—Referred, together with Liq. Carbonis Detergens, to SC. III.

SC. III, 3/1/09—Formula to be similar to Liquor Carbonis Detergens (with coal tar); 7/16/09—Change title to "Liquor Pyrolei Alkalinus."

Comments:—H-g, 7/16/09—Pyroleum is the title in the Swedish Pharm. for Coal Tar; it is believed to be ideal and will distinguish this preparation from "Picis-Tar."—Br, 7/21/09—If *not needed*, "Liquor Picis Alkalinus" should be dismissed, but the title should *not* be transferred to Liquor Carbonis Detergens. This latter is a distinctive preparation, recognized in several of the foreign pharmacopœias. Its use here is increasing to an extent that warrants its introduction into the N. F. But by no means *should titles be confounded.*—R-r, 7/28/09—In this connection, call attention to a paper on "Liquor Picis Carbonis" which has been prepared for the Annual Meeting.

240. Liquor Potassii Arsen. et Brom.

"Confer."—Referred to SC. V to correct synonyms.

SC. V, 7/6/09—Omit synonyms—"Liquor Arseni Bromidi" and "Solution of Bromide of Arsenic." Add the same "Caution note," as suggested for No. 209. Delete present note (See No. 306 to No. 308).

242. Liquor Saccharini.

"Confer."—The question of retaining Saccharin in the preparations of the N. F. is referred to SC. I, acting as a Special Committee.

SC. V, 7/6/09—Delete note (See No. 306 and No. 308).

243. Liquor Seriparius.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss; 7/16/09—Drop.

Comments:—B-r, 7/21/09—Dismiss.

244. Liquor Sodii Arsenatis, Pearson.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss. 7/16/09—Drop.

Comments:—B-r, 7/21/09—Should be retained as it is occasionally directed and the official Liquor Sodii Arsenatis is so much stronger. *Caution dictates retention.*

245. Liquor Sodii Boratis Comp.
"Confer."—Satisfactory.
SC. II, 1/17/09—Use liquified Phenol, 3.3 Cc., instead of (3 Gm.) crystalized.

246. Liquor Sodii Carbolatis.
"Confer."—Dismiss.
SC. III, 3/1/09—Dismiss. 7/16/09—Drop.
Comments:—H-g, 7/16/09—Little used. To avoid complications, leave out. B-r, 7/21/09—Dismiss.

247. Liquor Sodii Citratis.
"Confer."—Formula Satisfactory, but delete ("G. P.") after the synonym "Potio Riveri," and the note.
SC. V, 7/6/09—Delete ("G. P.") and the note. Make first paragraph of directions read: "Dissolve the Citric Acid in the Water, contained in a strong bottle, add the Sodium Bicarbonate, dissolve by agitation and immediately stopper with a well-secured cork."
SC. III, 7/16/09—Listed with preparations to be dropped or modified.
Comments:—W-t, 7/21/09—Would favor retaining this as it is or deleting it entirely. R-r, 7/28/09.—The foreign pharmacopœial titles in this and other preparations *should not be omitted:* They should be correctly given as synonyms and thereby increase the value of the N. F.

249. Liquor Sodii Oleatis.
"Confer."—Referred to SC. III, together with Sodium Stearate. SC. III, 3/1/09—and 7/16/09—Change title to "Liquor Sodii Stearatis."
Comments:—B-r, 7/21/09—No need for either of the titles.

254. Lotio Adstringens.
SC. V, 7/6/09—Originally called "Warren's Styptic Balsam" and administered *internally* (See Amer. Journ. Pharm., 1854, 246). Not intended as a "Lotion." Recommend deletion.
Comments:—W-t., 7/21/09—Agree with recommendation.

256. Lotio Nigra.
"Confer"—Believed to be satisfactory but referred to SC. V.
SC. V, 7/6/09—Change directions to read: "Shake the Mercurous Chloride with 5 Cc. of Water, contained in a suitable bottle, and gradually add sufficient solution of Lime to make 1,000 Cc."

257. Lotio Plumbi et Opii.
"Confer"—Referred to SC. II.
SC. II, 7/23/09—Physicians do not agree to what should be used—some prefer solution of Lead Subacetate, other prefer the Acetate. The Subacetate more completely precipitates the gummy matter. The preparation is not used frequently enough to warrant a change.

258. Magma Magnesiæ.
"Confer"—Referred to SC. II.
SC. II, 7/23/09—Reduce the (quantity of) Magnes. Sulphate to 220 Gm. and the Sodium Hydroxide to 72 Gm. This will give a trifle over 50 Gm. of (Magnes.) Hydroxide to 1,000 Cc., or 0.2 Gm. to 4 Cc. which is more than the present requirement of 3 grains to the teaspoonful. Follow the present directions but use Boehm's method of washing (See "Bulletin", 1908, 242).
SC. II, 7/16/09—Change title to "Mistura Magnesii Hydroxidi."
Comments:—H-g., 7/16/09—"Mistura" is believed to be preferable to "Magma;" also for No. 9.

259. Mistura Acaciæ.
"Confer"—Delete.
SC. III, 7/16/09—Drop.

260. Mistura Adstringens et Escharotica.
"Confer"—"The precipitate formed when mixing the ingredients is intended to be retained. Direct the mixture to be shaken." Referred to SC. V.
SC. V, 7/6/09—Change title to read: "Liquor Cupri et Zinci Acidus; Acid Solution of Copper and Zinc."
Retain synonym, "Villate's Solution."
SC. III, 7/16/09—Change title to: "Liquor Cupri et Zinci Acetatis."

Comments:—W-t., 7/21/09—Do not favor the proposed titles. Why not include the Lead? D-l., 8/6/09—If the precipitated Lead Sulphate is a constituent part, it becomes a "Mixture," not a solution. Evidently the whole subject requires further consideration.

261. Mistura Ammonii Chloridi.
"Confer"—Referred to SC. II.
SC. II, 7/23/09—Use the Pure Extract of Licorice, U. S. P. No other change necessary.

262. Mistura Camphoræ Acida.
"Confer"—Referred to SC. II.
SC. II, 7/23/09—It has been stated that fuming Nitric Acid should be used. As this is not recognized in the U. S. P. we do not think it of importance to make the change.

276. Mistura Guaiaci.
"Confer"—"Formula satisfactory, but eliminate note. Referred to SC. V.

SC. V, 7/6/09—Change formula and directions to read: Tinct. Guaiac, 125 Cc.; Honey, 250 Cc.; Cinnamon Water, 625 Cc.—Rub the Honey over the surface of a suitable mortar and pestle, add the Tincture of Guaiac gradually and mix thoroughly with the Honey; (then) add the Cinnamon Water gradually while stirring the mixture. This mixture should be well agitated when dispensed and used.

Comments:—W-t., 7/21/09—Should be made B. P. or omitted. B-r., 7/21/09—This is somewhat of a change; would like to have opinion of physicians on same. We have no call for this preparation. Has anyone elsewhere?

277. Mistura Oleo-Balsamica.
"Confer"—Referred to SC. IV.

SC. IV, 7/21/09—Recommend the following formula, which corresponds with that of the German Pharmacopœia. The "parts" of the P. G. are by weight, including the finished product; we recommend parts by measure throughout, conforming to the usages of American pharmacy, and producing a practically identical preparation, when the finished product is also measured.

Oil of Lavender Flowers	4 Cc.
Eugenol	4 Cc.
Oil of Cassia	4 Cc.
Oil of Thyme	4 Cc.
Oil of Lemon	4 Cc.
Oil of Myristica	4 Cc.
Balsam of Peru	16 Cc.
Alcohol, a sufficient quantity, to make	1,000 Cc.

Dissolve the ingredients in 900 Cc. of Alcohol, filter and add Alcohol through the filter to make the product measure 1,000 Cc.

280. Mistura Rhei Composita.

"Confer"—Formula satisfactory. Refer synonym "Squibb's Rhubarb Mixture" to SC. V.

281. Mistura Sassafras et Opii.

"Confer"—Formula satisfactory. Refer synonyms and dose for infants to SC. V.

284. Mistura Sulphuria Acida.

SC. V, 7/6/09—Change title to read: "Spiritus Acidi Sulphurici; Spirit of Sulphuric Arid." Omit synonym: "Mistura Sulphurica Acida (G. P.)."

Comments:—B-r., 7/21/09—Cannot agree with the change. This is not a "Spirit" according to classification as now understood. The G. P. calls it "Mixtura Sulfurica Acida;" the Austr. P., "Liquor Acidus Halleri." Being commonly prescribed as a "Mistura," why not retain the titles official in the Germ. and Austr. Pharmacopœias. R-r., 7/28/09—The foreign pharmacopœial titles in this and other preparations (as mentioned under No. 247) should *not* be omitted.

285. Mucilago Chondri.

"Confer.—"Delete the note.

SC. III, 7/16/09—Drop the alternative formula.

286. Mucilago Dextrini.

"Confer.—"Dismiss.

SC. III, 7/16/09—Drop.

287. Mucilago Salep.

"Confer.—"Satisfactory.

SC. III, 7/16/09—Drop.

288. Olea Infusa.

"Confer.—"Referred to SC. II. Use only Olive Oil.

SC. IV, 1/21/09—The G. P. recommends Olive Oil for Oleum Hyoscyami, and it is believed that this oil possesses the essential qualifications of blandness, keeping quality, absorption, power to dissolve, miscibility, etc. The attempt to select a cheaper, yet bland oil, is evidenced in the French Codex, where Poppy Oil is directed, and in the Ph. Helvetica, where Sesame Oil is directed. The Ph. Sv. follows the P. G. so far as the selection of the oil. It is believed that this will be far more acceptable from the standpoint of purity and keeping than the present N. F. mixture of Lard and Cotton Seed Oils. Six hours is sufficient time for maceration, although the P. G. directs one hour, the Ph. Sv. 12 hours, and the French Codex and N. F. III, 24 hours. The formula proposed is as follows:

The Dry Herb in No. 30 powder	100 Gm.
Alcohol	1000 Cc.
Ammonia Water (10 per cent)	2 Cc.
Olive Oil	1000 Gm.

Moisten the Herb with the Alcohol and Ammonia Water, previously mixed, macerate for six hours in a covered vessel and then add the Olive Oil. Warm this mixture on a water bath at a temperature between 60° and 70° C., in an open vessel, frequently stirring until the Alcohol and Ammonia Water are dissipated. Transfer the Oil to a strainer, express the residue and finally filter the product. The Infused Oil should be kept in small, amber colored bottles in a cool place.

289. Oleatum Aconitinæ.

"Confer."—Referred to SC. IV, for review.

SC. IV, 1/21/09—"We recommend the use of equal parts of Olive Oil and Oleic Acid, as suggested by the Chairman of the General Committee at the Hot Springs Meeting."

290. Oleatum Zinci.

"Confer."—Referred to SC. IV.

SC. IV, 1/21/09—Recommend change of title to "Zinci Oleas." Use Zinc Sulphate instead of Zinc Acetate, since it is a much more commonly used salt. Soap of definite moisture content to replace the solution of Sodium Oleate, and a definite temperature to be recommended for the solutions, when precipitated. Temperature below 20°C. and above 70°C. have proved unsatisfactory. The following is the formula recommended:

Zinc Sulphate	47 Gm.
Soap, dry and granulated	100 Gm.

Distilled Water, a sufficient quantity to make about 100 Gm. of Zinc Oleate. Dissolve the Zinc Sulphate in 2500 Cc. of Distilled Water, and filter through cotton, if necessary. Dissolve the Soap in 1500 Cc. of hot Distilled Water, and strain the solution through cotton. Heat both solutions to about 50°C. (122°F.) and pour the solution of Zinc Sulphate, slowly, into the Soap solution, constantly stirring. Collect the precipitate on a muslin strainer or on clean paper, protected from dust, without exposure to heat. When dry, pass it through a fine sieve and preserve it in well stoppered vials in a cool place.

SC. III, 7/16/09—Change title to "Zinci Oleatum."

SC. II, 7/23/09—Combine No. 249 and No. 290 as follows:

Soap, dried and granulated	315 Gm.
Zinc Acetate, crystalized	115 Gm.
Water, q. s.	

Mix the Soap with 1250 Cc. of Water so as to form a uniform, gelatinous mixture; then add 3500 Cc. of Water and heat until dissolved. Follow this with the directions under No. 290 but insert the word "cold" before solution of of Sodium Oleate in the 4th line.

292. Oleum Carbolatum.

"Confer."—Satisfactory.

SC. II, 7/23/09—Use Olive Oil in place of Cottonseed Oil and change the titles to conform to the U. S. P. (i.e. "Oleum Phenolatum; Phenolated Oil").

SC. III, 7/16/09—Drop.

Comments:—H-g, 7/16/09—Never used any more; the less number of preparations of Phenol, the better; they are dangerous.

293. Oleum Hyoscyami Compositum.

"Confer."—Referred to SC. IV.

SC. IV, 1/21/09—Recommend the following formula (which is an adaption of the formula for the "Baume Tranquille" of the French Codex):

Hyoscyamus, U. S. P., in No. 30 powder	10.0 Gm.
Belladonna Leaves, in No. 30 powder	10.0 Gm.
Stramonium, in No. 30 powder	10.0 Gm.
Poppy Leaves, in No. 30 Powder	10.0 Gm.
Alcohol	40.0 Cc.
Olive Oil	1000.0 Gm.
Oil of Lavender Flowers	0.2 Cc.
Oil of Peppermint	0.2 Cc.

B-L

Oil of Rosemary..... 0.2 Cc.
Oil of Thyme..... 0.2 Cc.

Moisten the mixed leaves with Alcohol and set the mixture in a covered vessel for at least six hours. Then add the Olive Oil and warm on a water bath at a temperature of 60°C. to 70°C., with frequent stirring until the Alcohol is is entirely evaporated. Now transfer to a strainer and express; to the expressed oil add the essential oils and filter. The product should be kept in small amber colored bottles in a cool place.

Comments:—(The following comments, reproduced here *verbatim*, evidently are written by the member of the Sub-committee having charge of this preparation, but are doubtless concurred in by the other members):

1. We suggest the use of the synonym "Tranquille Balsam" as indicating the Americanized formula for the "Baume Tranquille" of the French Codex.
2. The French Codex formula contains in addition to Belladonna Leaves (Deadly Nightshade), also 50 Gm. of "Morelle". The "Morell Noire" is the tops and leaves of Solanum Nigrum L. (Nightshade), but as this is not *now* an article of commerce in this country, I believe that we can omit it in the formula, but if it should be included and the drug become so recognized, it is collected abroad and could readily be imported. In my opinion, it would add very little indeed to the solanaceous drugs in the formula and can be spared.
3. Poppy Leaves, "Pavot" of the Codex, are now imported and are quoted by such well known houses as Park, Davis & Co., and Lehn and Fink, and being of a distinctly different composition from the solanaceous drugs. I would retain same as an ingredient in the N. F. formula.
4. The Codex uses "Poppy" Oil in both the infused oil of Hyoscyamus and the compound oil of Hyoscyamus. Believing that at present pure Olive Oil is, in the United States, more readily obtainable than pure Poppy Oil, I would recommend Olive Oil in both formulas of the N. F. Besides, the Codex is hardly consistent, as it directs "Oilve Oil" in infused Oil of Anthemis and also in Camphorated Oil.

295-302. Pastæ Dermatologicæ.

"Confer."—Referred to SC. II.

SC. V, 7/6/09—Delete all of No. 295 after "Dermatologic Pastes" (and before No. 296—see No. 306 to No. 308).

304. Petrolatum Saponatum Liquidum.

"Confer."—Satisfactory.

SC. V, 7/6/09—Omit Synonym "Liquid Petrox."

Comments:—W-t, 7/21/09—Would favor the omission of "Petrox" if the intention is to get rid of it because of its being a meaningless or misleading contraction. If, however, the motion is made because of a supposed conflict with "Petrogen" I would call attention to the fact that Petrox antedates Petrogen and that the latter is but a commercialization of published work. B-r, 7/21/09—Why omit these vernacular synonyms; these names are already become familiar and this is the very idea that will popularize their use. (These comments apply equally to No. 305).

305. Petrolatum Saponatum Spissum.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Omit synonym. "Solid Petrox."

SC. II, 7/23/09—After numerous experiments not prepared to suggest any change in this formula at present.

Comments:—See under No. 304.

306-308. Pilulæ.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Following the recommendation to delete the introductory remarks to Syrups (See No. 393), the Sub-Committee conclude their report, *verbatim* as follows:

"For pill coating we have also worked out improved schemes, if such are to be retained, but we are fully convinced that all this matter should be deleted from the Formulary. In our opinions these introductions should have place in text books and commentaries only, and should not be part of a formulary. It is a grave question, in our minds, whether or not such notes, followed by untrained persons, may not do more harm than good. In cases where instructions or cautions may become, as in No. 25, a legitimate part of the regular directions of the formula, they should be used. Notes which attempt to fix standards will, necessarily, be omitted when standards are established. Therefore, holding these decided views:

"We move that Numbers: 22, 27 (note), 113, 114, 115 (note), 119, 133 (all after "Fluidextract"), 204 (note), 209 (note), 238 (2nd paragraph of note), 240 (note), 242 (note), 295 (all after "Dermatologic Pastes") 306, 307, 308, 309 (note), 316 (note), 337, 338, 339, 340, 341, 390, 391, 392, 393, 437, 473, 479 (1st paragraph), be deleted." (This is signed by the entire Sub-Committee—Hynson, Scoville and Dunning).

SC. III, 7/16/09—The Sub-Committee is unanimous on the question of retaining the Descriptive Articles and General Formulas and asks that the entire Committee carefully consider this question.

Comments:—B-r, 7/21/09—"I concur in the recommendation to omit all directions for pill coating as not being applicable to the manufacturing pharmacists who prepare these by their own methods in large quantities, and we had better not fix methods which would become legalized. I likewise approve the suggestions made regarding deletions covered in the final paragraph of the report of the (Sub.) Committee V, with the exception of 391 and 392 which relate to formulas and if these formulas for pencils of Salicylic Acid and Cocaine are used the formulas should be retained. H-g, 7/9/09—"If there is any one feature of the book which I felt satisfied with and which I know from experience is appreciated, it is these notices. They are in the right place when they want to refer to them, and they are very helpful. I know that the description in the dosage forms has been instrumental in practically ridding the retail drug business of the various forms of coated pills, even the tablets being largely superceded by the triturate and especially the gelatin encapsulating." A-y, 7/16/09—Cannot too strongly second the views expressed by you. (H-g). To say that such directions should be relegated to the whims and personal prejudices of the writers of text books, is too absurd to consider. I would count it a most unfortunate step, if the very valuable general directions given on Pills (No. 306) Effervescent Powders (No. 338), Dermatologic Pastes (295) should be omitted. E-l, 7/16/09—Descriptive articles and type formulas should be retained. There can be no possible objection from any view-point of their retention, besides serving as a valuable asset in showing the physician, as well as the average druggist, that these things can readily be provided without having recourse to the factory and machine-made article.

309-336. Pilulæ ad Prandium to Pilulæ Triplices.

"Confer."—All pills are referred to SC. III, and their report to SC. II except No. 322 (Pil Antiperiodica) which is referred to SC. IV.

310. Pilulæ ad Prandium.
SC. V, 7/6/09—Delete Note (See No. 306 to No. 308).
316. Pil. Aloin. Strychn. et Belladon.
SC. V, 7/6/09—Delete Note (See No. 306 to No. 308).
319-321. Pil. Antineuralgicæ.
"Confer"—Introduce a formula for the Extr. of Aconite Leaves, required in formula 1 (Gross') equals No. 320.
SC. III, 7/16/09—Drop form. 2 (Brown-Sequard's) equals No. 321.
Comments:—H-g., 7/16/09—Formula 2 (No. 321) is out of date; Gross' (No. 320) is enough.
322-324. Pil. Antiperiodicæ.
"Confer"—Specially referred to SC. IV.
SC. IV, 1/21/09—"In view of the polypharmacal character of this preparation, we would recommend its omission, but if retained, see no reason why the formula should be changed."
Comments:—S-e., 5/31/09—"The proposition to drop the Antiperiodic Pills simply on the ground that they are polypharmacal seems to me ridiculous. The term wont kill any old and established preparation, and it may not even hurt it."
329. Pil. Glonoini.
SC. III, 7/16/09—Change title to "Pilulæ Glycerylis Nitratis."
237. Pulveres.
SC. III, 7/16/09—Delete (See No. 306 to No. 308.)
338-341. Pulveres Effervescentes.
'Confer"—Referred to SC. V.
SC. V, 7/6/09—"All effervescent salts, or formulas having to do with effervescent salts (Nos. 3, 6, 338, 339, 340, 341, 350, 351, 358, 361, 362, 364, 366, 367 368, 369, 370, 373), have been committed to three able and thoroughly practical pharmacists who have large and varied experience with such products; these gentlemen, with the comments of two of our members—Scoville and Dunning—in hand, are at work and will reformulate all these numbers and make careful experiments. Their revised formulas will be carefully considered before they are submitted to the General Committee."
342. Pulv. Acaciæ Comp.
"Confer"—Delete the letters ("G. P.") after "Pulvis Gummosus."
SC. III, 7/16/09—Drop.
344.—Pulv. Amygdalae Comp.
"Confer"—Satisfactory.
SC. III, 7/16/09—Drop.
Comments:—B-r., 7/21/09—Dismiss.
345. Pulv. Anticatarrhalis.
"Confer"—Referred to SC. III.
SC. III, 7/16/09—Change title to "Insuflatio Bismuthi et Morphinæ."
Comments:—H-g., 7/16/09—There should be at least one representative of each class of preparations used in medical practice in the N. F. This answers well for insuflation and is far less objectionable than the only other used, viz., Cocaine. B-r., 7/21/09—Dismiss.
346. Pulv. Antisepticus.
"Confer"—Satisfactory.
SC. II, 7/23/09—Add to the directions to pass through a No. 80 seive.
347. Pulv. Catechu Comp.
"Confer"—Formula satisfactory, but reconstruct text and omit note.

SC. III, 7/16/09—Modify, else drop.
Comments:—E-l., 7/16/09—Should be "Pulv. Gambir Comp."

348. Pulv Cretæ Aromat.
"Confer"—Referred to SC. II. Eliminate Saffron and omit Note.
SC. V, 7/23/09. Modify, else drop.

349. Pulv. Cretæ Arom. c. Opio.
"Referred to SC. V, to eliminate note."
SC. II, 7/23/09—No change (in formula) necessary

353. Pulv. Iodoformi Comp.
"Confer"—Satisfactory.
SC. III, 7/16/09—Modify, else drop.
Comments:—E-l., 7/16/09—Naphthalin predominates.

345. Pulv. Kino Comp.
"Confer"—Eliminate note.
SC. III, 7/16/09—Change title to "Pulvis Kino et Opii."

355. Pulv. Myricæ Comp.
"Confer"—Satisfactory.
SC. III, 7/16/09—Modify, else drop.

356. Pulv. Pancreaticus Comp.
"Confer"—Satisfactory, but eliminate last paragraph of note.

357. Pulv. Pepsini Comp.
"Confer"—Referred to SC. II.
SC., 1/17/09—Use 1.5 Gm. of Pepisn instead of Saccharated Pepsin.
Comments:—D-g., 7/16/09—Agree with recommendation but do not believe it will remedy the fault of caking. B-r., 7/21/09—See views in Am. Jour. Pharm. (July, 1909, 331) on this and on No. 53. R-r., 7/28/09—The amount of Pepsin in this preparation is ridiculously small. Instead of 1.5 Gm. suggest 15 Gm. of Pepsin. "Is it a wonder that physicians claim that the present preparation is therapeutically nil?"

359. Pulvis Pro Lacte Humanisato.
"Confer"—Dismiss.
SC. III, 7/16/09—Drop.

365. Pulv. Talci Salicyl.
"Confer"—Satisfactory, but eliminate note.
SC. III, 7/16/09—Modify, else drop.

374. Species Emolientes.
"Confer"—Referred to SC. V.
SC. V, 7/6/09—Change titles to read:—"Cataplasma Althææ Composita; Compound Althæa Poultice." Change directions to read: "Reduce the dry substances to a coarse powder and mix; make poultice with hot water when required.'"
Comments:—W-t., 7/21/09—Althæa Leaves are not the most active ingredients of this mixture. B-r., 7/21/09—This is a foreign preparation official in the Ph. Ger., Ph. Helv. and Ph. Aust. as "Species Emollientes" and is well classified as a "Species," so I would retain title "Species."

376. Species Pectoralis.
"Confer."—Formula satisfactory, but eliminate ("G. P.") after the synonym "Breast Tea."

377. Spiritus Acidi Formici.
"Confer."—Formula satisfactory, but eliminate note.

378. Spiritus Aromaticus.
"Confer."—Referred to SC. IV.

379. Spiritus Cardamomi Comp.
"Confer."—Formula satisfactory, but referred to SC. IV.
SC. IV, 1/21/09—Recommend the following formula:

Oil of Cardamom	20.00 Cc.
Oil of Orange	20.00 Cc.
Oil of Cassia	2.00 Cc.
Oil of Cloves	1.00 Cc.
Oil of Anise	1.00 Cc.
Oil of Caraway	0.10 Cc.
Alcohol, a sufficient quantity, to make	200 Cc.

Mix the oils with 140 Cc. of Alcohol, finally adding a sufficient quantity of Alcohol to make the Spirit measure 200 Cc.

Comments:—D-l, 8/7/09—If this formula is adopted the note under the present formula no longer applies and must be eliminated. S-e, 5/31/09—We cannot have two Comp. *Spirits* of Cardamom and one of a different strength, and composition is already official, and in my judgment should be retained.

380. Spiritus Curassao.
"Confer."—Referred to SC. IV.
SC. IV, 1/21/09—This formula should be omitted if the proposed formula for "Elixir of Curascao" (No. 51) is accepted.

381. Spiritus Olei Volatilis.
"Confer."—Dismiss.
SC. III, 7/16/09—Drop.

Comments:—D-l, 8/7/09—This is believed to be a mistake, if approved, unless individual formulas for dilutions of the volatile oils prescribed in the formulary-preparations are introduced. E-l. 7/16/09—"Not called for."

382. Spiritus Ophthalmicus.
"Confer."—Dismiss.
SC. III, 7/16/09—Drop.

384. Spiritus Saponis.
"Confer."—Dismiss.
SC. III, 7/16/09—Drop.

Comments:—E-l, 7/16/09—Too liable to be mistaken for Lin. Sapon Camph. U. S. P.

386-387. Spongia Compressa and Spongia Decolorata.
"Confer."—Dismiss.
SC. III, 7/16/09—Drop.
Comments:—E-l, 7/16/09—At Hot Springs "Mechanics" were deleted.

389. Suppositoria Boroglycerini.
"Confer."—Referred to SC. II.

SC. II, 7/23/09—The present formula does not produce Boroglycerin but a Glycerite of Boric Acid. We therefore recommend the following: Glycerinated Gelatin, 20 Gm.; Glycerite of Boroglycerin, U. S. P., 15 Gm.; Glycerin, 13 Gm.—Melt the Glycerinated Gelatin over a water bath, add the Glycerin and Glycerite of Boroglycerin and pour into well oiled moulds, which should be slightly warmed. The suppositories should be oiled and dispensed in glass containers or in parraffined paper.

390-392. Stili Dilubiles.
"Confer."—Satisfactory.
SC. V, 7/6/09—Delete (See No. 306 to No. 308.)

393. Syrupi.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Omit whole subject, or if any part is to remain, omit last paragraph and substitute the following: "Syrups should be preserved in small bottles which have been sterilized by passing steam into them for ten minutes, then rinsed with a little alcohol and drained; they should be stored in as even a temperature as possible, preferably at 20° to 25°C. (68° to 77°F.) in diffused light or in a dark place. A loosely fitting stopper is allowable, but if the syrup is to be stored for any length of time, the bottle should be capped to prevent evaporation. Syrups which have begun to ferment, or which have perceptibly darkened, should not be dispensed. (See No. 306 to No. 308.)

Comments:—W-t, 7/21/09—Favor the recommendation to omit the whole subject. R-r, 7/28/09—The temperature is too high in my opinion for the keeping of Syrups; 10° to 15°C. would be better.

394. Syrupus Actææ Comp.

"Confer."—Satisfactory.

SC. V, 7/6/09—Change title to Syrupus Cimicifugæ Compositus. Omit; "Compound Syrup of Actæa or Black Cohosh)."

SC. III, 7/16/09—Change titles as recommended by SC. V.

397. Syrupus Calcis Chlorohydrophosphatis.

"Confer."—Delete second synonym: Formula satisfactory.

SC. V, 7/6/09—Omit synonym: "Syrup of Chlorohydrophosphate of Lime."

SC. III, 7/16/09—Drop (?).

398. Syrupus Calcii et Sodii Hypophos.

"Confer."—Formula satisfactory. Delete 2nd synonym.

SC. V, 7/6/09—Omit synonym: "Syrup of Hypophosphite of Lime."

399. Syrupus Calcii Hypophosphitis.

"Confer."—Formula satisfactory. Delete 2nd synonym.

SC. V, 7/6/09—Omit synonym: "Syrup of Hypophosphite of Lime."

405. Syrupus Coffeæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—After the word "roasted" insert: "in fine powder." Make by cold percolation using a menstruum of 100 Cc. of Glycerin and 300 Cc. of Water. When this has passed, continue percolation with water until 450 Cc. of percolate are obtained. In this dissolve the Sugar by agitation and add enough more of percolate to make 1000 Cc. (Macerate 24 hours before percolating.) This makes a preparation far surpassing that by the present formula.

406. Syrupus Eriodictyi Aromat.

"Confer."—Referred to SC, II.

SC. II, 7/23/09—Change the first part of the direction to read: "Dissolve the Oils in the Alcohol and add the fluidextract and the tincture. Then add the solution of Potassium Hydroxide and 325 Cc. of Water, shake the mixture thoroughly and filter. If the filtrate is not perfectly clear add 5 Gm. Magnesium Carbonate, shake thoroughly and pass through filter until clear. (The remainder of the directions remain the same as before.)

407. Syrupus Ferri Arsenatis.

"Confer."—Satisfactory

Comments:—D-l, 8/7/09—In a note to "Soluble Ferric Arsenate" in the Yearbook of Pharmacy 1908 (p. 508), Power and Rogerson observe that, 0.40 Gm. Sodium Arsenate (the quantity in this formula) requires 0.686 Gm. Anhydrous Ferric Citrate, which is practically double the quantity (0.35 Gm.) prescribed in the N. F.

408. Syrupus Ferri Citro-Iodidi.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—In the 5th line of the directions, change "32" to "125," and in the 8th line, change "200" to "100." In the 9th line strike out the words "until it assumes a green color" and insert—"for ten minutes. The solution should be green; if not, add 10 Gm. of dry powdered starch, shake thoroughly and filter."

410. Syrupus Ferri Hypophosphitis.

"Confer."—Satisfactory, but referred to SC. V.

SC. V, 7/6/09—Change formula and directions to read:

Ferric Hypophosphite	17.5 Gm.
Sodium Citrate	30.0 Gm.
Sugar	425.0 Gm.
Syrup of Orange Flowers	200.0 Cc.
Syrup	300.0 Cc.
Distilled Water	q. s.

Dissolve the Ferric Hypophosphite and the Sodium Citrate in 225 Cc. of Distilled Water, by the aid of heat; cool and filter; dissolve the Sugar in the filtrate, strain the liquid and pass enough Water through the strainer to make the product measure 500 Cc. To this add the Syrup of Orange Flowers and the Syrup, and mix thoroughly."

Comments:—B-r, 7/21/09—Recommend "Stronger Orange Flower Water" and Sugar in place of Syrup of Orange Flowers. See no advantage in change from 25 Gm. Potass. Citrate to 30 Gm. Sodium Citrate.

411. Syrupus Ferri Lactophosphatis.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Change formula and directions to read:

Ferrous Lactate	17.5 Gm.
Phosphoric Acid	15.0 Cc.
Distilled Water	25.0 Cc.
Sugar	80.0 Gm.
Syrup	900.0 Cc.
Distilled Water	q. s.

Dissolve the Ferrous Lactate in the Water to which the Phosphoric Acid has been added, dissolve the Sugar in the solution, strain, add the Syrup and sufficient Distilled Water, through strainer, to make 1000 Cc. Mix thoroughly."

Comments:—B-r, 7/21/09—The solution of Ferrous Lactate in Phosphoric Acid and Water *should be filtered* before adding the Sugar. D-l, 8/7/09—The repetition of "Distilled Water" in the formula may be avoided by directing to —"Dissolve the Ferrous Lactate in the Phosphoric Acid diluted with 25 Cc. of Distilled Water," etc.

413. Syrupus Ferri Saccharati Solubilis.

"Confer."—Referred to SC. III. Also, omit ("G. P.") after "Syrupus Ferri Oxydatis Solubilis."

414. Syrupus Glycyrrhizæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Retain the present formula, but add 5 Cc. of Chloroform. If the pure extract of Licorice, U. S. P. is used (as required) this makes an elegant syrup, far superior to formulas recommended in the "Bulletin."

Comments:—B-r. 7/21/09—Calls attention to criticism in Am. Journ. Ph. (July 1909, p. 320) which see.

415. Syrupus Hydrochlorophosphatum.

"Confer."—Rerferred to SC. II

SC. II, 7/23/09—Recommendation will be withheld until after a paper on the subject is presented at the A. Ph. A. Meeting.

417. Syrupus Mannæ.

"Confer."—Satisfactory.

SC. III, 7/16/09—Listed among preparations to be dropped or modified.

418–421. Syrupus Morphinæ Comp. and Syrupus Morphinæ Sulphatis (1 & 2).

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss; 7/6/09—Drop.

Comments:—A-y, 3/1/09—Syrupus Morphinæ Sulph. (No. 121) is believed to be used in the South under the title "Syrupus Morphinæ, 7/16/09—No demand in New Orleans.

423–424. Syrupus Papaveris.

"Confer."—Referred to SC. IV.

SC. IV, 11/21/09—The first formula (No. 423) should be omitted as there is no B. P. preparation at present. The second formula (No. 424) should be changed to the following:

Tincture of Poppy, N. F. ..... 200 Cc.
Syrup (U. S. P.). ..... 300 Cc.

Mix them. This change makes the preparation to correspond to the present P. G. formula for Syrupus Papaveris, but the preparation known as Syrupus Diacodii is an entirely different one, now obsolete in Germany and no reference should be made to it in the footnote.

SC. III, 7/16/09—Modify, else drop.

Comments:—B-r, 1/21/09—Calls attention to his criticism in Amer. Journ. Pharm. (July 1909, p. 320) which see.

425. Syrupus Pectoralis.

"Confer"—Formula satisfactory. Omit note.

SC. IV, 1/21/09—We deplore the presence of such a formula in the N. F., and especially its popular use, since its chief activity is due to the Morphine Hydrochloride. Since there exists a popular demand for it, however, there should be a standard formula. The present formula is satisfactory, but we recommend that the original formula of Dr. Jackson as referred to in footnote be made the official formula. The public should be educated to avoid the use of such a preparation, and every pharmacist should assist in this education.

Comments:—S-e, 5/31/09—I think the first formula, which is proposed to be dropped, is preferable in every way to the second. I would not object to dropping the article itself, but if it is retained I cannot see any object in substituting a fussy process and a poor flavor for a good flavor and easy process.

426. Syrupus Phosphatum Comp.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Recommendation withheld until after a paper on this subject is presented at the A. Ph. A. Meeting.

427. Syrupus Pini Strobi Comp.

"Confer."—Referred to SC. III—Question of Morphine.

SC. III, 3/1/09—Leave out Morphine (H-g), Change formula (A-y).

SC. II, 7/23/09—If the Morphine is to be retained, we advise reducing it to 0.4 Gm. as recommended by Hilton (See Circular Letter No. 13), but we do not advise reducing the amounts of the other ingredients to meet his formula.

Comments:—S-s, 7/23/09—Believe it unwise to retain a formula, containing Morphine, that is liable to be used continuously as this may be. I therefore

agree with *H-g* that the Morphine should be omitted or perhaps substituted by Codeine. B-r. 7/21/09—Calls attention to his criticism in Amer. Journ. Pharm. (July 1909, p. 321) which see.

428. Syrupus Quinidinæ.

"Confer."—Referred to SC. II—Contains 1 gr. Saccharin in 1 Fl. oz.

SC. II, 7/23/09—Omit Saccharin.

Comments:—B-r, 7/21/09—Calls attention to his criticsim in Amer. Journ. Pharm. (July 1908, p. 323), which see.

429. Syrupus Rhamni Catharticæ.

"Confer."—Formula satisfactory, but referred to SC. II.

SC. II, 7/23/09—Should be dropped because it is impossible to obtain the fermented juice on the market. Furthermore, the preparation is seldom used, being largely replaced by other preparations.

SC. III, 7/16/09—Drop.

Comments:—H-g, 7/16/09—The juice cannot be had. E-l, 7/21/09—Difficult to get the juice of the berry. B-r, 7/21/09—Calls attention to his criticism in Amer. Jour. Pharm. (July 1909, 323), which see.

131. Syrupus Rubi Aromaticus.

"Confer."—Satisfactory, but referred to SC. V.

SC. V, 7/6/09—"Reduce the Blackberry Root and Spices to a moderately coarse (No. 40) powder, pack in percolater, macerate for 24 hours and percolate in the usual manner with diluted Alcohol until 240 Cc. of percolate are obtained. To this add 325 Cc. of Blackberry Juice and the Sugar, agitate until solution is effected, strain and add, through strainer, enough Blackberry Juice to make 1000 Cc."

Comments:—B-r, 7/21/09—Why such an odd amount as 128 Gm. Rubus? Why say Rubus, U. S. P.? Is not "U. S. P." understood for all? If official names are adopted as presumably will be, then change Cinnamon to "Saigon Cinnamon;" Nutmeg to "Myristica;" Alspice to "Pimenta." R-r, 7/28/09—Although in favor of the names which are in daily use, it is our duty to use correct U. S. P. nomenclature: "Rubus," "Myristica," and "Pimenta."

433. Syrupus Sennæ Aromaticus.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Change the formula as follows:

Fluidextract of Senna	125.0 Cc.
Fluidextract of Rhubarb	17.0 Cc.
Resin of Jalap	3.5 Gm.
Cinnamon	4.0 Gm.
Cloves	4.0 Gm.
Nutmeg	2.0 Gm.
Oil of Lemon	1.5 Cc.
Sodium Borate	10.0 Gm.
Alcohol	30.0 Cc.
Sugar	700.0 Gm.
Pumice Stone	25.0 Gm.
Water	q. s.

Triturate the Jalap (Resin), cloves, Cinnamon and Nutmeg with the Pumice tone; add the Oil, Alcohol and Fluidextracts, and then the Sodium Borate previously dissolved in 200 Cc. of Water. Macerate for 24 hours with occasional agitation, then filter and wash filter with Water until 500 Cc. of filtrate are obtained. In this dissolve the Sugar by agitation and add Water to make 1000 Cc. This gives a fine preparation containing but little Alcohol.

434. Syrupus Sennæ Comp.
"Confer."—Referred to SC. II.
SC. II, 7/23/09 — Omit the Alcohol. Dissolve the Oil in the Fluidextracts, then add 5 Gm. of Sodium Borate and enough Syrup to make 1,000 Cc.

436. Syrupus Stillingiæ Comp.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—Add 5 Gm. of Sodium Borate to the fitrate before using the Sugar.

437. Tincturæ.
SC. V, 7/23/9.—Delete (see No. 306 to No. 308).

438–440. Tinct. Aconiti, Fleming.
"Confer."—Satisfactory.
SC. III, 7/16/09—Drop.
Comments:—H-g., 7/16/09—No need of this; dangerous.
E-l., 7/16/09—Dangerous.

441. Tinct. Amara.
"Confer."—Satisfactory, but eliminate last sentence of note.
SC. III, 7/16/09—Listed among preparations to be dropped or modified.

442. Tinct. Antacrida.
SC. III, 7/16/09—Drop.
Comments:—H-g., 7/16/09—Who could swallow this? E-l., 7/16/09—Not used.

446. Tinct. Aromatica.
"Confer."—Satisfactory, but drop note, except definition of "Galangal."
SC. III, 7/16/09—Listed with preparations to be dropped or modified.

447. Tinct. Capsici et Myrrhæ.
"Confer."—Satisfactory.
Comments:—R-r., 7/11/09—Quoting "Lloyd Bulletin," No. 11, says "Samuel Thomson—not Thompson—originated the six remedies. Should, therefore, be "Thomsonian Number Six."

448. Tinct. Cinchonæ Detannata.
"Confer."—Referred to SC. II.
SC. II, 7/23/09—No change necessary.

450. Tinct. Cresoli Saponata.
"Confer."—Referred to SC. V.
SC. V, 7/6/09—Change the directions to read: "Fuse the Soap over water-bath, remove from heat and dissolve in 500 Cc. Alcohol, add Cresol and sufficient Alcohol to make 1,000 Cc.; mix and filter, using a covered funnel."
SC. III, 7/16/09—Drop.
Comments:—H-g., 7/16/09—No need of this; only confused with Liquor, U. S. P. W-t., 7/16/09—Is an unnecessary duplication. R-r., 7/28/09—Entirely superfluous, as the U. S. P. Liquor Cresol Co. serves all purposes and can can be diluted if necessary. B-r., 7/17/09—Will try.

451. Tinct. Ferri Chloridi Ætherea.
"Confer."—Formula Satisfactory. Omit note.
SC. III., 7/16/09—Listed with preparations to be dropped or modified.
Comments:—R-r.,————calls attention to the correction of the synonym "Bestucheff's Tincture." It should be "Bestscheff's Tincture." E-l., 7/16/09—Delete note. Correct "Bestuscheff."

452. Tinct. Ferri Citro-Chloridi.

"Confer."—Referred to SC. II.

SC. II, 1/17/09—Recommend the suggestion of E. H. Squibb ("Bulletin," 1908, 280) to substitute 390 Gm. of *Potassium* Citrate for 425 Gm. of Sodium Citrate. This removes "the common complaint of crystallization in making Elix. Iron, Quinine and Strychnine, which was overcome by the use of the Potassium Salt in this tincture.

Comments:—B-r., 7/21/09—Will try out this suggestion practically.

453. Tinct. Ferri Pomata.

"Confer."—Satisfactory, but omit note.

SC. III, 7/16/09—Listed with preparations to be modified or dropped.

456. Tinct. Iodi Decolorata.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Title should be changed to "Liniment. Iodi Decoloratum" (H-g.); Omit (A-y.).

Comments:—B-r., 7/21/09—Title should be retained as it is the one by which the preparation is called for. It is not a *Liniment.*

459. Tinctura Kino Composita.

"Confer."—Formula Satisfactory—Referred to SC. V to reconstruct titles.

SC. V, 7/6/09—Change titles to read: "Tinctura Kino et Opii Composita; Compound Tincture of Kino and Opium."

SC. III, 7/16/09—Same change of titles as recommended by SC. V.

461. Tincture Pectoralis.

"Confer."—Referred to SC. I to revise dose.

462–463. Tinct. Persionis and Tinc. Persionis Comp.

"Confer."—These are referred to a Special Committee on "Color Standards:" Arny, Seltzer and England (the latter having resigned from the Committee, Mr. Raubenheimer taking his place).

Comments:—E-l., 7/16/09—The predominating color of No. 463 is the Caramel; hence description would better read "reddish-brown."

464. Tinct. Pimpinellæ.

"Confer."—Satisfactory.

SC. III, 7/16/09—Listed with preparations to be dropped or modified.

465–467. Tinct. Rhei Aquosa.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—No. 465 the title "Tinctura Rhei Aquosa" should be retained. 7/16/09—No. 466 modify, else drop; Drop 2nd formula (467).

Comments:—A-y., 3/1/09—Ommission refers only to alternative formula. E-l., 7/16/09—This is still used to a slight extent. B-r., 7/21/09—Dismiss (meaning 2nd. formula?) D-l., 8/9/09—The recommendations and references in the reports of the Sub-committee are not clear.

468–470—Tinct. Rhei et Gentianæ.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss: No. 468 Tinct. Rhei et Gentianæ title; No. 469 Tinct. Rhei et Gentianæ; No. 470 Tinct. Rhei et Gentianæ alt. formula.

Comments:—D-l., 8/9/09. This is not clear, unless it means to dismiss the whole subject. B-r., 7/21/09—Dismiss 468; 469; 470.

472. Tinct. Saponis Viridis Comp.

"Confer."—Formula satisfactory. Refer title to SC. V.

SC. V, 7/6/09—Change titles to read: Linimentum Olei Cadini Saponatumr Saponated Liniment of Cade." Add: (Compound Tincture of Soap. Former Edition)." Change directions to read: "Fuse Soap over water bath, remove from heat and dissolve by stirring with 750 Cc. of Alcohol; when cool, add Oil of Cade and filter; wash filter with sufficient Alcohol to make 1000 Cc. of filtrate. SC. III, 7/16/09—Recommend the same title as above by SC. V.

Comments:—B-r, 7/21/09—Will try. R-r, 7/28/09—"Linimentum Saponis Mollis Compositum" is better title. Unecessary to employ heat to dissolve the Soap in the Alcohol.

473. Tinct. Tolutana Aetherea.

"Confer."—Referred to SC. V.

SC. V, 7/6/09—Delete (see No. 306 to No. 308).

474. Tinct. Tolutana Solubilis.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss; 7/16/09—Drop.

Comments:—H-g, 7/16/09—Fraud. E-l, 7/16/09—Never should have been admitted.

475. Tinctura Vanillini Comp.

"Confer."—Referred to SC. IV.

SC. IV, 1/21/09—"Will be reported on in the near future."

476. Tinct. Viburni Opuli Comp.

"Confer."—Referred to SC. II.

SC. II, 1/17/09—Change the second line of directions to read as follows: "Glycerin with 335 Cc. of Water and 400 Cc. of Alcohol and moisten the ——. On the next page use diluted Alcohol instead of the mentruum given.

Comments:—B-r, 7/21/09—In an experience on a commercial scale the correct menstruum is Glycerin 75, Water 175, Alcohol 750, finish with 1 vol. Water and 3 vol. Alcohol.

479-483. Unguenta Extensa.

"Confer."—Satisfactory.

SC. V, 7/6/09—Delete first paragraph (?) (See No. 306 to No. 308).

SC. III, 7/16/09—Change title to "Unguextensa."

Comments:—H-g, 7/16/09—The contraction "Unguextensum" is recommended since experience has proved that the adjective "Extensum" as a termination (of the title) is overlooked.

488. Ung. Resorcini Comp.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Recommend a formula which will be presented by Mr. Dunn at the meeting of the Association.

Comments:—S-r, 8/7/09—Mr. Hall and myself have taken the method suggested by Dunn, Prof. Remington's suggestion of substituting Yellow Wax for Paraffin, and the suggestion of several writers to replace Oil of Cade, wholly or to the amount of one-half, by Birch Tar, under advisement. All seem to be worthy of adoption, but further time is required for consideration.

490. Vinum Aurantii.

"Confer."—Recommend White Wine in place of Sherry.—Referred to SC. II.

SC. II, 7/23/09—Replace with the natural Wine of Orange which is now a commercial article.

Comments:—D-l, 8/9/09—The Wine of Orange N. F. is Wine *flavored* with Oil of Orange. The *Natural* Wine of Orange, is the fermented Orange Juice, and has no flavor of Orange Oil at all. Hence cannot be used to replace the N. F. preparation.

491. Vinum Aurantii Comp.

"Confer."—Satisfactory, but omit note.

SC. III, 7/16/09—Listed witth preparations to be dropped or modified.

492-493. Vinum Carnis and Vinum Carnis et Ferri.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Change the first part of directions of both these preparations to read: "Triturate the extracts with 65 Cc. of hot water and add with continuous stirring 175 Cc. of Alcohol. Allow the mixture to stand in a cool place or in a refrigerator for two or three days; then filter and wash the filter with a mixture of 5 Cc. of Water and 15 Cc. of Alcohol, etc.——."

In the formula substitute q. s. for the amounts of Water and Alcohol.

SC. III, 7/16/09—Change titles to "Vinum Extracti Carnis" and "Vinum Extracti Carnis et Ferri," respectively.

Comments:—H-g, 7/16/09—The addition of "Extracti" to Carnis is obvious.

494. Vinum Carnis Ferri et Cinchonæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—No change (in formula) necessary.

SC. III, 7/16/09—Change title to "Vinum Extracti Carnis, Ferri et Cinchonæ." (See No. 492 to No. 493.)

405. Vinum Cocæ Aromaticum.

"Confer."—Referred to SC. III.

SC. III, 3/1/09—Dismiss; 7/16/09—Drop.

Comments:—B-r, 7/21/09—Dismiss.

497. Vinum Pepsini.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—No change necessarv,

499. Vinum Pruni Virginianæ.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—Reduce the amount of Sugar to 100 Gm. and add 100 Gm. of Glycerin.

500. Vinum Pruni Virg. Ferratum.

"Confer."—Referred to SC. II.

SC. II, 7/23/09—No change necessary.

501. Zinci Oleo—Stearas.

"Confer."—Referred to SC. IV.

SC. IV, 1/21/09—We would recommend the omission of this preparation, since the Zinci Oleas (N. F.) and the Zinci Stearas (U. S. P.) amply supply the demand for this class of preparations. We would also recommend that the U. S. P. introduce a working formula for Zinc Stearate, prepared from Zinc Sulphate, Stearic Acid and Ammonia Water.

B.—PROPOSED ADDITIONS.

Additions:—Recommended by Sub-Committee III. (3/1/09.)

Aqua Lauro-Cerasi.
Carbasa—General formula.
Collyria—General directions and formulas.
Diastase.
Elixir Acidi Salicylici Comp.
Elixir Rubrum.
Elixir Sabal Comp. (Saw Palmetto.)
Extract Malt—Combinations.

Extract Ol. Morrhuæ (Morrhuol. Gaduol).
Fluidext. Avena Sativa.
" Baptisia.
" Condurango.
" Chionanthus.
" Cocillana.
" Dioscorea.
" Drosera.
" Echinacea.
" Helonias.
" Nepeta.
" Senecio.
" Trifolium.
Glyceritum Acetyl-Morphinæ Comp. (Heroin). Formula in "Bulletin," 1908, 344.
Gossypia—General formula.
Lecithin.
Liquor Ammoniæ Anisatus.
Liquores Hypodermatici—General directions and formulas.
Liquor Hypodermaticus—Ergotæ.
Liquor Hydrastis—(Colorless).
Mistura (Magma) Bismuthi.
Papayin (Caroid).
Petrolatum Saponatum: Formula with Iodine, etc.
Petrolatum Spray Solutions: Formulas.
Pilulæ Phenolphthaleini Comp. (Probilin.)
Pilulæ 3 Valerates (Ferri, Quininæ et Zinci).
Rennet (Renninum).
Syrupus Ammonii Hypophosphitis.
Tabula—under pharmaceutic titles:
Calc. Sulphide.
Coryza.
Rhinitis.
Seiler's.
Tinct. Ambrosia.
Cactus.
Passiflora.
Pulsatilla.
Trypsin.
Vinum Extracti Olei Morrhuæ.

ADDITIONS:—RECOMMENDED BY SUB-COMMITTEE IV. (1/21/09.)

Elixir Cardamomi Compositus.
Elixir Vanillini Compositus.
Spiritus Vanillini Compositus.
The formulas for the two Elixirs have been given under the subject of Elixirs (see No. 23). That proposed for the Compound Spirit of Vanillin, is as follows:

Vanillin	50.0 Gm.
Oil of Orange	10.0 Cc.
Oil of Cardamom	3.0 Cc.

Oil of Cassia..... 2.0 Cc.
Alcohol, a sufficient quantity to make.....200.0 Cc.
Dissolve the Vanillin in 105 Cc. of Alcohol, add the oils and a sufficient quantity of Alcohol to make the Spirit measure 200 Cc.

ADDITIONS:—RECOMMENDED BY O. RAUBENHEIMER. (JAN. 17, '09.)

Elixir Formalis.
Extract of Malt and Cod Liver Oil.
Burow's Solution.
Fluidglycerates.
Honey and Borax.
Honey of Rose and Borax.
Compound Solution of Glycerophosphates.
Liquor Carbonis Detergens.
Milk of Bismuth.
Tincture of Larkspur.

(Mr. Raubenheimer's suggestions were made in response to a request of the Chairman of the Section on Practical Pharmacy and Dispensing to select N. F. subjects for investigation and report at the Annual Meeting.)

C.—SUBJECTS REFERRED TO SPECIAL COMMITTEES.

SACCHARIN:—Referred to SC. I as Special Committee. The Committee have not yet come to any agreement on this subject, but the Chairman believes that a report will shortly be agreed upon for submission to the General Committee.

COLOR STANDARDS: Referred to a Special Committee composed of Arny, Seltzer and England originally; but Mr. England, having resigned from the Committee, his successor, Mr. Otto Raubenheimer, has consented to act with the Special Committee. The Chairman of this Special Committee, Mr. Arny, has on several occasions submitted to the Chirman of the General Committee, correspondence, which gives evidence of marked industry and persistence in the endeavor to solve a very intricate problem. The report of the Special Committee, dated July 22,'09, will be laid before the General Committee in the next Circular Letter. The Experimental part consisted in: (a) Comparison of a dilution of the coloring agent with a standard color; (b) dilution of the coloring agent to a point where its solution is colorless; (c) a third general plan, which has not been tried for want of time, consists in bleaching out the coloring agent or its dilution by trituration with a Labarraques solution, or other bleach, of known strength. The conclusions, *verbatim* are as follows:

1. The schemes of comparison of tinctorial power tried out by the Committee are too unreliable in our present knowledge of the subject, to justify any definite recommendations of color standards for the next issue of the Formulary.

II. Believing that, in time, a basis of standardization will be reached, the Committee recommends that even though it is not advisable to delay the work of revision by waiting at this time for further investigations in this direction, such research should be continued. In conclusion, the Chairman of the Sub-Committee, will be pleased to furnish any member of the N. F. Committee so desiring, copies of the voluminous correspondence and reports passing between the members of the Sub-Committee. The following suggestions of Mr. Raubenheimer, having bearing on the Color querstion are submitted:

I. The practicality of including short and precise descriptions of N. F.

galenicals (such as are in Erganzungsbuch III, Deutsch-Ap. Verein) should be considered.

II. The average Caramel is too heavy to measure accurately in small quantities, and therefore a Tincture of Caramel (Caramel and Diluted Alcohol p. aeq.) is suggested.

III. The reduction of Cudbear in the tincture (No. 462) from 125 Gms. to 1000 Cc. to 100 Gms. to 1000 Cc. is advised, believing that by so doing a more uniform tincture will be ohtained since it seems impossible to extract all the Coloring out of 125 Gm. with 1000 Cc. percolate.

Lastly, the entire Committee believes that both Cudbear and Caramel are too valuable coloring agents to be dropped from the Formulary as was suggested to us), even though preparations made from them do sometimes vary in tint.

(Signed by all the Members of the Special Committee.)

Basic Elixirs:—This subject was submitted to SC. IV, as a Special Committee to readjust the Flavors and Alcoholic Strength of certain elixirs and particularly to take int consideration the question of New Basic Elixirs. The report of this Committee (Jan. 21, 1909) exhibits the progress made in this direction, but much remains to be done, particularly as regards the adjustment of the Alcoholic Strengths of Elixirs and of other N. F. preparations.

In reply to some passages in Circular Letter No. 13 (Feb. 20, '09), the Chairman of SC. IV says: "In connection with the estimation of the Alcohol percentages, we feel that any work done at this time would require to be done over again when the final formulas have been tried out and finally adopted before taking up this work, which can be done very promptly when the time comes." "We are doing further work along the line of Basic Elixirs and are trying to follow the instructions of the General Committee, so far as understood by us." That we can look forward to further good work on the subject of Basic Elixirs and the Alcohol readjustment is evident from a paper communicated by Mr. Mr Beringer at the recent meeting of the New Jersey Pharmaceutical Association entitled "Formulas for Some New Basic Elixirs." which, in addition to the formulas already reported to the N. F. Committee, gives a formula for another New Basic Elixir, "Elixir Amygdalæ Compositum."

In a communication antedating the report of Sub-Committee IV, Mr. Scoville (Sept. 26, 1908) submits a tentative plan for the readjustment of Flavors and the Alcoholic Strength of Elixirs, which deserves to be recorded here on account of its practical possibilities. Instead of a series of Basic Elixirs, Mr. Scoville suggests the introduction of Compound Spirits of Certain Volatile Oils, of such strength that 125 Cc. will be sufficient to impart the necessary Flavors to 1000 Cc. of finished elixir, if the spirit is made with strong Alcohol or, if Diluted Alcohol is used in order to make the fiavor water soluble, by a method to be devised, to use proportionally more.

Non-Official Ingredients:—Mr. Hynson submits a list of Non-Standardized articles used in National Formulary preparations, which, is here intended to serve simply as a memorandum, as follows:

Acid, Formic.
Acid, Metaphosphoric.
Albumin.
Anethol.
Ferric Peptonate.
Ferrous Lactate.
Gold Tribromide.
Juice, Blackberry.

Bone Ash.
Calamine.
Calcium Glycerophosphate.
Calcium Lactate.
Caramel.
Carmine.
Coffea Arab., Roasted.
Coffea Arab., Unroasted.
Cumarin.
Dextrin.
Diacetyl-Morphine.
Diastase.
Extract of Beef.
Juice, Buckthorn, fermented.
Juice, Lime.
Oil of Absinthium.
Oil of Curacao Orange.
Oil of Sage.
Pumice.
Quinidine.
Rennin.
Rum, Jamaica.
Salep.
Salt.
Sodium Glycerophosphate.
White Wine, Angelica.

COMMENTS FROM PERSONS OUTSIDE OF THE COMMITTEE:—The thanks of the Association are due to the following persons outside of the Committee, who have during the year addressed the Chairman directly on various subjects connected with the betterment of the Formulary:—W. A. Puckner, S. L. Hilton, Oscar Oldberg, Geo. L. Kelly, J. A. La Penotiere, Lehn & Fink, Launcelot W. Andrews (Mallinckrodt Chemical Works), E. G. Eberhardt (Eli Lilly & Co.), F. S. Hereth (Eli Lilly & Co.), and Val. Schmidt. The several communications were promptly acknowledged and their import submitted to the General Committee.

D.—COMMENTS OF THE CHAIRMAN.

When I began the preparation of the foregoing "Epitome" of the reports of Sub-Committees, it was my intention to make my comments on their findings in some detail, and to offer certain suggestions that might be helpful in carrying on the work. This report, however, to be available at the Annual Meeting, must be completed without delay, and I shall therefore confine my remarks to, at this time, salient points, reserving more detailed comments and suggestions to be communicated by Circular Letters later.

PROGRESS OF THE REVISION.

It must be apparent on a perusal of the "Epitome" that, in so far as the individual preparations are concerned, substantial progress has been made, and that by far the larger number of those assigned at Hot Springs for investigation are ready to be re-committed for final action. Furthermore, that the faults found and corrected were in most instances of a trivial character, and by no means so glaring as might be believed from the endless criticisms that have been made. But while these in many instances are hypercritical, in others they have served the good purpose of forcing a review, and consequently a correction of imperfections that would otherwise have escaped notice.

CORRECTION OF NEW FORMULAS.

The preparations which have been subject to more severe criticism than others are incidentally also those with which pharmacists in general are least familiar. These are the new preparations which have come into use during the last decade and introduced into the Formulary—such as the solutions of Proteid compounds, Elixirs of Glycerophosphates, etc. These also have received attention, and the work on them is sufficiently advanced to warrant the conclusion that most of them are ready for recommittal and final disposition.

READJUSTMENT OF FLAVORS AND ALCOHOLIC STRENGTH.

One of the most pronounced faults of the older preparations of the Formulary is the sameness of Flavor and, in some instances, their excessive Alcohol content. As mentioned under Basic Elixirs, this subject is being investigated by Sub-Committee IV, and it is hoped that the question will be satisfacforily settled at an early date, since the revision of some of the Elixir formulas depends upon the decision reached. Personally, I am not opposed to the admission of "New Basic Elixirs," if we can find a place for them as adjuvants in other formulas; but I am rather inclined to accept the view of Scoville, to introduce a number of "Compound Spirits of Volatile Oils," improving (according to my conception) on his idea, however, as follows:

COMPOUND SPIRITS OF VOLATILE OILS.

"Dissolve the Volatile Oils necessary to flavor 1000 Cc. of Elixir in 100 Cc. of Alcohol, and add enough Distilled Water to make 125 Cc.

Such a preparation, no matter how variable the quantity of Volatile Oils or Water, always contains 100 Cc. of Alcohol in 125 Cc; and by using the latter quantity to make 1000 Cc. of Elixir, the flavor will be uniform, irrespective of the other ingredients. At the same time, it forms a basis for the Alcohol percentage calculations. For example, we wish to prepare Elixir of Potassium Bromide to contain the full flavor, but only 15% by volume of Alcohol. We take:

Potass. Bromide	175 Gm.
Compound Spirit of Volatile Oils	125 Cc.
Alcohol	50 Cc.
Syrup	350 Cc.
Distilled Water enough to make	1000 Cc.

(Add Talc. and filter, etc.)

SPIRITUS OLEI VOLATILIS.

The Conference voted to dismiss the general formula for preparing the Spirit of a Volatile Oil. As mentioned under No. 381, I believe this to be a mistake. These Spirits were intended as convenient solutions. (1.) For measuring the Volatile Oils in carrying out the formulas, and (2,) for preserving the Volatile Oils in a good condition, in conformity with the recommendation in my paper on "Elixirs and Medicated Wines," published in "The Pharmacist" in 1872 (see The Evolution of the National Formulary, in the "Bulletin," Jan. 1908, 17). This purpose of the general formula (No. 381), appears to have been lost sight of completely. So, for example, Sub-Committee IV, under No. 51 (Elixir Curassao), says: "A note should be included in the preface of the N. F., that where small quantities of Volatile Oils are to be measured, dilutions should be made, and accurate measurements obtained by using this dilution." I therefore recommend that the question of dismissing these Spirits of Volatile Oils be reconsidered.

COLOR STANDARDS.

The question of Color Standards is a most perplexing one, but the Special Committee should, at all events, continue their efforts to supply formulas for coloring solutions that shall be reasonably uniform in tinctorial power. As I have said to the Chairman (Mr. Arny) in a letter of May 24th, I do not consider

it expedient or practical to publish a color-chart in the Formulary, and that the definition of different shades of color should be descriptive, such, for example, as--red, deep red, dark red, light red, faint red, (pink), etc., believing that slight variations in shade depending on individual judgment, can be safely ignored. Some experiments should be made to determine to what extent the coloring matters on the market—Cudbear, Caramel, etc.—vary in different samples, and how the material is to be treated to obtain a suitable coloring solution. But any other than the simplest methods of standardization will prove disastrous, since it is not likely to be carried out by the average pharmacist.

ADDITIONS.

The number of articles proposed for admission into the Formulary is not formidable, even if all are accepted, and will be easily handled. Steps will be taken to dispose of this question, and to make the proper assignments of such for investigation.

DEFINITIONS OF NON-OFFICIAL INGREDIENTS.

This, in consideration of the Food and Drug Act, requires our careful consideration. The whole question has been tentatively assigned to Sub-Committee V, but steps must be taken to make definite assignments of such non-official articles as are now included among the ingredients of accepted formulas. and this will be done without unnecessary delay.

ELIMINATION OF INTRODUCTORY NOTES OF INSTRUCTION.

One of the most revolutionary measures proposed is that of Sub-Committee V, to eliminate all introductory notes and general processes, with certain limited exceptions, from the Formulary, on the ground that such instructions, etc., should have place in the text books and commentaries only, and should not be a part of a formulary. The Sub-Committee having submitted a motion, which if carried will eliminate such introductory notes from a large number of preparations (see No. 306 to No. 308), I, as Chairman, must refrain from discussing the question at this time. It is but fair, however, to direct attention here to the adverse arguments brought to bear on the same subject, by Hallberg, Arny, and Eliel, in which they point out the utility of such introductory notes in the Formulary.

PUBLICITY.

In conformity with the recommendation of this Committee in their report to the Association at Hot Springs, the "Bulletin" was declared to be the official organ of the Committee on National Formulary, and directed to promptly publish such matters as may be sent to the Editor by the Chairman. (See Proceedings, 1908, 492—493.) For various reasons no use has been made of this provision; but recent demands for more satisfacfory publicity of the reports of the Sub-Committee and the Comments made thereon, make it necessary to resort to the pages of the "Bulletin" for their prompt publication, so that all the members of the Committee may share in the information addressed to the Chairman of the General Committee.

Under the prevailing practice, this information was communicated in abstract by the Circular Letters, which are addressed to all the members, while

the original reports were referred directly to the Chairmen of the Sub-Committees. This led to a remonstrance from Sub-Committee IV (March 24, '09), who pointed out the desirability that reports of Sub-Committees in full be sent to *all* members of the General Committee—"in order that formulas suggested may be tried by any who wished to do so, and in order that the detailed work and opinions as submitted by Sub-Committees may be placed in full before the members of the General Committee." Subsequently, at a joint meeting of S-C. IV, with two members of SC. V (held in Philadelphia April 6,'09), the following resolution was adopted:

"It is the sense of this meeting that copies of reports of Sub-Committees be submitted in full to all members of the General Committee, and after approval by the majority of the members, published in abstract in the Bulletin of the A. Ph. A. as 'Reports of Progress.' Subsequently, all the comments and criticisms to be submitted, with the original report, to such Sub-Committees as the Chairman elects."

It is not my purpose now, or at any time, to criticize this somewhat extraordinary resolution, but I unreservedly admit that *all* the members are entitled to *all* the information concerning the work of the Sub-Committees. Under the present practice—typewritten with carbon copies—it is impracticable to furnish a sufficient number of copies by a single writing; two writings are necessary, and that also means two proof readings. This procedure, if it is applied to the demand made, entails so much additional work that an amanuensis under fixed pay will be required, even if it is decided to install the apparatus necessary for producing mimeograph copies.

Disclaiming any discourtesy to the members of the Committee, who are responsible for the above resolution, I think their objection will be met if the following procedure is adopted:

"The Chairman will communicate with all of the members by Circular Letter, as heretofore."

"The Chairmen of Sub-Committees will send their reports to the Chairman of the General Committee, *in duplicate*, one—the original, the other—a carbon copy."

"The Chairman will then transmit the original copy of the report, with his comments (if any) to the Editor of the "Bulletin for publication, such to take precedence over less important or non-official matter if it reaches the Editor within the time limited for the next following number."

Respectfully submitted,

Louisville, Ky., Aug. 12, 1909. C. Lewis Diehl, *Chairman.*

On motion of Mr. Ladish, seconded by Mr. Osseward, the Chairman's Report on the proposed revision of the National Formulary was referred to the Committee on Publication, and the recommendations concurred in.

In the absence of the authors, the following papers were read by title and referred to the Committee on Publication: "Pepsin and Pancreatin; Their Chemistry and Uses," by Bernard Sacks, of New York City; "Improved and Original Formulas," by Joseph Weinstein, of New York City; "Glyceritum Iodi," by F. M. Apple, of Philadelphia, Pa.; "Tincture of Larkspur Seed, by Curt. P. Wimmer, of New York City; "Liquor Antisepticus Alkalinus Ruber," by J. Leon Lascoff, of New York City; "Production of Buttermilk from Sweet Milk by Means of Lactic Acid Bac-

teria," by F. W. Nitardy, of Denver, Col.; "Beef, Wine and Iron," by L. E. Sayre, of Lawrence, Kan.; "Suppository Base," by H. A. B. Dunning, of Baltimore; "Preparation of Ampuls," by Caswell A. Mayo, of New York City; "Journalistic Pharmacy," by Henry P. Hynson, of Baltimore; "Two Suggested Additions to the National Formulary," by Hugh Craig, of New York City; "The Ideal in Pharmacy," by H. A. Peairs, of Los Angeles, Cal.; "Notes on the Perfume Industry," by P. Henry Utech, of Meadville, Pa.; "Compound Resorcin Ointment," by Jas. O. Burge, of Nashville, Tenn.; "Elixir Gentianæ Glycerinatum," by J. Diner, of New York City.

Mr. E. G. Eberle read a paper on "Practical Pharmacy as Association Work," which was, on motion, referred to the Committee on Publication. The following is the text of the paper.

PRACTICAL PHARMACY AS ASSOCIATION WORK.

BY E. G. EBERLE.

The value of associations can only be determined by results accomplished. The results are measured by whatever the more advanced deem essential for the progress in line with their views. So long as pharmacists conduct the drug business in accord with the present methods, just so long will it be necessary for them to pursue the methods of merchants in handling wares and merchandise and at the same time to sustain their standing as professional men. The argument pro and con of the practicability of separating the drug business so that there will be on the one hand a class of drug merchants and on the other compounders and preparers of medicines is not taken into consideration in this paper, but whatever is suggested is in line with the conditions prevailing at least in most sections.

There is a gradation in the purposes of associations scaling from the local bodies to the national organizations. Local associations have their inception largely from suggestion of local conditions. Of late years there has been formed what may be termed an amalgamation of the several trade interests into clubs for the promotion of the commercial features and, where the city is large enough, clubs composed of members of certain divisions of the same interests. Thus we have the Merchant's Clubs and Drug Clubs. We find that the membership of the former includes druggists and the latter is composed of members of the various drug interests from retailer to manufacturer. This movement is of great value, for under the social influences, the mind is active and the individual more inclined to regard his co-worker a friend and a laborer for the promotion of a cause in which his own energies are exerted. The combination of associating together at these weekly occasions of druggists and doctors influences a more cordial relationship and affords an opportunity of disseminating that in which the foremost of both professions are deeply interested. Here they touch elbows and the remarks made impromptu or prepared speeches

pave the way for actual work. Whether we regard this the basis or in the light of branches or offspring of the more formidable organization cuts no figure, let it suffice that there is a possibilty here of means, which through the developing influences of the other bodies, attain to activity and thereby achieve results to which not one organization but all contributed. We must not diversify too much or the energy scatters, but with all let us ever have the purpose of improvement in view.

The local association must handle commercial affairs, but aside from this, here is the place to promote methods of doing business and to learn, one from another, how preparations may be improved, how to recognize and test drugs and chemicals, in other words contributing to or sharing in the work of creating the standards, namely the U. S. Pharmacopœia and National Formulary and, if you please, the idea more recently advanced of establishing a Book of Formulas.

As in work of this character all of the associations are concerned, I will endeavor to give this subject consideration and it is really the principal object of this paper, and which perhaps entitles it to consideration before this section.

For a number of years past I have endeavored to present papers before our State Association (Texas) that deal with practical work. The subjects have varied dealing with home-made apparatus to the assay of drugs, and their preparations. I have endeavored to impress that the man is the best pharmacist who can improvise apparatus, provided it will do the work accurately, economically and satisfactorily. I enjoy seeing a student in school improvise, provided the work indicates careful calculation. A home-made thermometer or mercurial barometer attract my attention and so with apparatus constructed for the purpose of doing special work in the laboratory or at the dispensing counter. The bugbear that confronts the pharmacist all too frequently is the term "standardization" and the expense of doing such work, when as a matter of fact including a sufficiently sensitive balance the outfit for doing assay work in a drug store will fall considerably below $100.00. Now I realize that it is false economy, in many instances, to devote unnecessary time to such work, but our laws demand that the votary have this knowledge and should be in position to do this work, and how can he without being equipped? Nor would I say that the druggist, for example after making syrup of ferrous iodide, should after making it determine whether it is of the proper strength, his skill as pharmacist should assure this. The same thing may be said of tinctures for which he should buy the drug of standard strength, but this does not do away with the necessity of being in position to do the work and in reality carrying out the determination. The returns are in the appreciation of the customer and physician, whereby he obtains prestige, and the chances are that when this pharmacist buys drugs he will obtain that which he desires. "To be competent" and "to do"

assists materially in establishing the standing of the druggist and he who accepts everything he buys regardless of quality will soon be discovered as a favored individual to whom can be sold that which the other rejects.

The local associations offer the best opportunity for this work because their meetings are more frequent, this of course applies also to local branches of the A. Ph. A. By educating those with whom our lot is cast or even if they have the education to make them more appreciative of the profession elevates and helps us. To diversify the program one may compound a preparation, another explain what the description in the Pharmacopœia of a drug means, how it can be recognized or distinguished from one closely allied and still another go through the tests of identification of a chemical or assay a drug. Naturally so as not to cause delay the work must be properly prepared in advance and the various steps shown by samples reserved. At our last meeting I explained the assay of a fluidextract, showed how the calculations were made, etc. The work was brought to the association complete to the washing out of the alkaloids. The apparatus necessary for this work was shown and uses explained. I suppose in most associations there are members who are not informed and are glad of having an opportunity to see how this work is done. Such work is more practical before local associations than the larger ones and where, it is assumed, explanation is sufficient without demonstration. However, I will say for my part the work done by Mr. Geo. M. Beringer at the Mackinac meeting was of far more value than if he had simply explained or outlined the methods of discovering sophistication of phenacetin. So, if a member at a local association, for example, prepares elixir of iron, quinine and strychnine phosphates, he will do more good than if he would simply explain; or if another has, for example, several varities of coca or pilocarpus and shows their distinguishing characteristics, it amounts to much more than reading the description or being told of it. Practical work and demonstration emphasize definition and therefore add interest and are at least one answer for how to make the meetings of associations of greater value and draw better attendance.

Carrying the proposition onward the invitation of physicians to participate in the meetings elicits from them in return information on the physiological action of drugs, their deficiencies, etc., and by consultation preparations may be improved upon and what is the result—a greater interest in the Pharmacopœia and National Formulary, a necessity for producing tangible results from propaganda work, in fact that is what this is in actuality. My appeal therefore is for practical work in pharmacy before associations at least the meetings of local, county, district and State associations, let the light set here in the Practical Pharmacy and Dispensing Section be reflected in the work you do nearer home. We are too apt to neglect our opportunities here and forget that by strengthening and upbuilding these associations we contribute to the success of the parent

organization. The medical associations have clinics, why should we not have demonstrations of how work is actually done? Not that, especially before a section of the A. Ph. A., we should take up operations, the average pharmacist should be posted in, but for proving or disproving contentions and the presentation of improved methods or the making of new preparations. "The Next Step," a paper by Dr. Geo. H. Meeker, on a practical plan for professional advancement of pharmacists, I think will have to be preceded by work of its kind which I believe will lead on to the plans outlined by him.

Mr. C. Osseward read a paper entitled "Four Months' Detail Work Among Physicians," which was directed to take the usual course of which the following is the text:

FOUR MONTHS' DETAIL WORK AMONG OUR PHYSICIANS.

BY C. OSSEWARD, SEATTLE, WASH.

Detailing the physicians with various products of fancy names has been and still is the most popular method of introducing these made-to-order prescriptions. No doubt it is the most prominent factor by which the manufacturer has so successfully replaced the retail pharmacist.

That detailing is a profitable investment there is no doubt, for the many men employed at an enormous expense by these various firms is sufficient proof. The manufacturer has been wide-awake and has successfully followed up the many opportunities. The retail pharmacist has not been as active, and because of this inactivity has been the loser.

If the manufacturers, who are often two thousand to four thousand miles away from the field of work, can be successful, why cannot the local pharmacist, who is at home among physicians he knows, do the same work, at least fully as successfully? The best way to find whether this could be done was to try it.

We have given it a four months' trial, and the reason we did not continue it longer was lack of time; our business during February and March requiring all the help in the store.

The first month for our trial was October, taking filled elastic capsules. Several samples were prepared, such as oil santal, santal and copaiba, copaiba and cubebs, methylene-blue comp., creosote and olive oil. We showed the difference between freshly-filled capsules and those of the manufacturers, which invariably show discoloration or darkening, depending on the time they have been in stock. Special attention was called to the fact that we could fill any combination they might wish to use, that they need not confine themselves to the limited number of formulæ given in the various catalogues of the manufacturers. The result of our work brought out the following facts:

First. The principal reason the physicians specified certain makes, was

simply because they had noticed these formulæ in this particular firm's catalogue.

Second. After they learned that they could get any formula dispensed, they at once begin writing their own combinations. Here are some of the many combinations:

1. Copaiba, oil santal, oil cinnamon.
2. Iron and ammon. citrate, copaiba, oleoresin cubeb. The iron and ammon. citrate was massed and introduced into the capsule before filling with other ingredients.
3. Oleoresin cubeb, pancreatin, salol. The pancreatin was also massed in this case, there being less trouble with leaky capsules.
4. Salol, urotropine, copaiba, oil cubebs, oil santal. Massed urotropine.
5. Methylene-blue, salol, oil santal.
6. Ext. kava kava, oil santal. Massed extract.
7. Ext. hydrastis, oil santal. Massed extract.
8. Salol, atropine, methylene-blue, oil santal. Use atropine alkaloid.

The following number capsule prescriptions were received after detailing: November, 45; December, 51; January, 50; February, 52; March, 60.

In November we gave our attention to yellow oxide mercury ointment. Ointment jars and collapsible tubes were both used for our sample, thereby showing the advantage of the tubes. We explained that our ointment was prepared from the freshly precipitated yellow oxide mercury, which was made into ointment of fifty per cent. strength while still moist, thereby obtaining an absolutely smooth product, which served as stock ointment. The detailing in this instance was confined to the specialists. The number of prescriptions received after our detail work were: November (19th to 30th), 14; December, 51; January, 12; February, 20; March, 30.

December was devoted to mercury biniodide in oil for hypodermic use, also the same in capsule form. We had noticed a considerable demand for a proprietary preparation which the physicians were using hypodermically. Also a number of prescriptions for capsules supposed to contain a one per cent. mercury biniodide. The hypodermic preparation is put up in one-ounce vials at $1.25 each, physicians' price.

The capsules are sold in bottles containing fifty capsules at $1.00 retail; each capsule is supposed to contain $\frac{1}{32}$ grain. We observed that the capsules varied a great deal in size, some weighing 0.2 Gm., while others weighed 0.5 Gm. We could not figure how accurate dosage could be obtained with capsules varying so widely. Another disadvantage was the number of capsules to be used daily.

There we have some good points to talk on:

First. Variation in size, showing impossibility of accurate dosage.

Second. Expensive medication.

We prepared our capsules with one per cent. biniodide in oil, each capsule containing the equivalent of $\frac{1}{12}$ grain. Three of our capsules, therefore, would be equivalent to eight capsules of the proprietary preparation. Hypodermic preparation put up in one-ounce glass-stoppered bottles at 50 cents per bottle, physicians' price. We have sold a number (probably two dozen) one-ounce bottles since detailing.

The number of prescriptions received for the capsules during December were 10; January, 12; February, 12; March, 15.

In regard to this preparation I would say that it is easily prepared by weighing the required amount of oil (we use castor oil), warming over the water-bath and dissolving the mercury biniodide in the warm oil by stirring. The oil used for hypodermic injection is, of course, sterilized.

During January we detailed fluid glycerates. This being a new line of preparations, it gives us the advantage of being the first in the field. We called attention to the advantage over fluidextract because of clear mixtures being possible when mixed with water, more pleasant taste, etc.

The number of prescriptions received containing fluid glycerates were: January, 27; February, 35; March, 36.

The experience gained during these four months has been very valuable to us. It certainly has convinced us that we must work if results are to be obtained.

It must be personal work, and being at home amongst physicians of our home city, our chances are better than those of the manufacturer, if we are equally as persistent in the work.

On motion the paper of Mr. Osseward was directed to take the usual course.

The Chairman presented a paper by himself entitled "Discussion of a Point in Professional Courtesy" and asked that it be read by title only. On motion it was referred to the committee on publication.

After installation of the new officers, Messrs. Ladish and White, Secretary and Associate respectively, the new Chairman being absent, the Section adjourned.

Papers read by title:

THE AMPUL AND ITS USES IN THE PRESERVATION OF STERILE SOLUTIONS.

BY CASWELL A. MAYO, NEW YORK, N. Y.

The term ampul or ampoule is applied to a glass container in which liquids may be sealed and preserved in a sterile condition. Ordinarily the ampul is used for hypodermic injections, but anaesthetics for inhalation are also put up in this form of container. Limousin,* inventor of the cacheteur, was the first to propose this method of dispensing.

* Bulletin Generale de Therapeutique, April 15, 1886 page 316.

The name given to the sealed glass tube by Limousin, "ampoule" is derived from the Latin "ampula" meaning vase or flask. The word "ampolla", which evidently has the same derivation, is used in both Spanish and Italian. It means simply "vial" though it is also applied to the ampul. Some Italian price lists speak of ampuls as "fiule chiuse a fuoco". In Germany the teutonized Latin form "ampulla" is used to designate the ampul or the German word Einschmelzglass, or sealed glass. In English "ampul"* is recognized as well as the French form "ampoule"† while I have preferred the former the latter seems to be gaining in popularity in the United States.

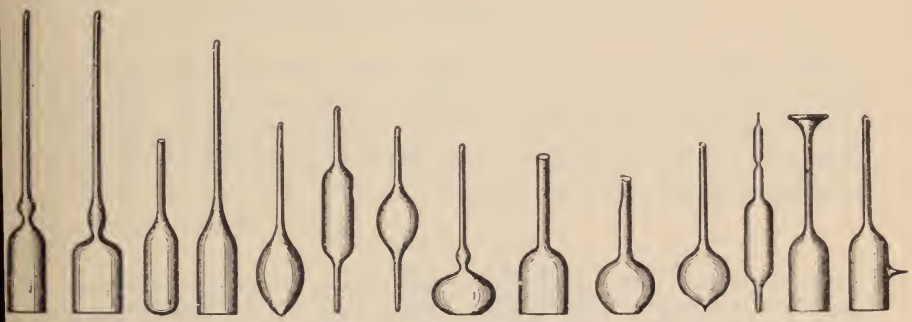
FIG. 1.

Original form of ampul proposed by Limousin.

THE FORM OF THE AMPUL.

Ampuls vary in capacity from half a cubic centimeter to a liter, the latter being used for massive injections of normal saline solution. The form varies as widely as the capacity. The form proposed by Limousin, see Fig. 1, consisted of a round bulb with a neck drawn out to a small tube. Figs. 2 and 3 from Hagers' "Handbuch der Pharmaceutischen Praxis" show a variety of

FIG. 2.



Various shapes of ampuls.

forms for various uses. In France and Italy where this method of dispensing has attained its greatest popularity, the simple tube sealed at both ends, seems, the more popular form though others are also largely used. In Germany decided preference is given to the bottle shaped ampul.

SPECIAL GLASS REQUIRED.

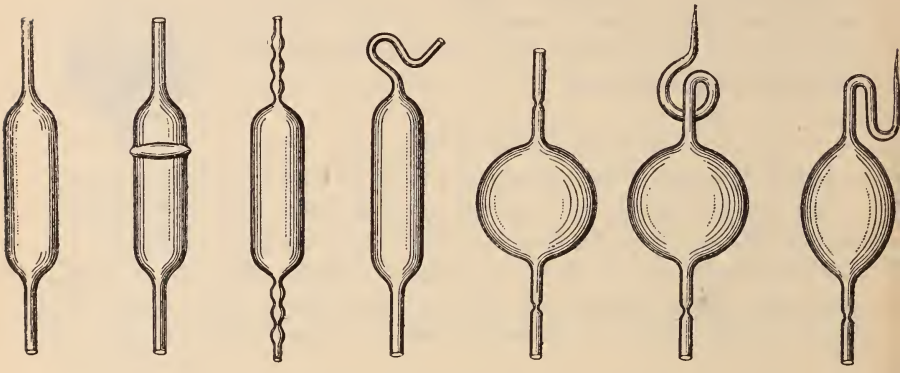
Ordinary glass contains soluble alkali which affects the contents of the ampuls, precipitating crystals of strychnine for instance, which may be

* Standard Dictionary.

† Foster's Encyclopedic Medical Dictionary.

small enough to pass through a hypodermic needle and still cause great pain when injected into the tissues. With such solutions it is necessary to use a neutral glass that generally preferred being known as "Jena Normal 16 III." Any ampul which yields a color when filled with phenolphthalein solution and boiled for half an hour should be rejected.* The Swiss Pharmacopoeia directs that the empty ampuls be rinsed with diluted hydrochloric acid followed by distilled water with the idea of neutralizing excess

FIG. 3.



Forms of ampuls used for massive injections.

of alkali. It has been shown that if a glass yields free alkali this expedient gives only temporary relief, the free alkali again manifesting itself on prolonged contact with the solution. Therefore ampuls made from neutral glass, such as the Jena Normal 16 III, should be used wherever the contents might be affected by an alkali.†

MAKING AMPULS.

The manufacture of empty ampuls has developed into a special business both in Paris and in Thuringia, Germany. Among the leading manufacturers of the empty ampuls are Adrian and Fournier, of Paris and Fridolin Greiner, of Neuhaus am Rennweg, near Jena, Germany.

The empty ampuls are not yet stocked generally in the United States. Where the dispenser is unable to purchase the ready-made ampuls he can make them himself if even only ordinarily skilful in glass blowing.

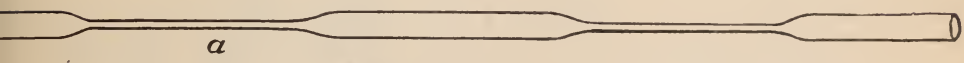
The beginner had best try the tube form, (the sixth from the left in Fig. 2) this being the simplest and easiest to make. For this purpose take thin-walled Jena normal tubing (it can be had from dealers in chemicals,

* Grubler, Pharmaceutische Post, 1907, No. 33. Schweizerische Wochenschrift fuer Pharmacie, 1907, R. page, 607. Pégurier, Bulletin de Pharmacie du Sud-Ouest, 1907.

† Kressler, Apotheker Zeitung 1908 No. 61. Beysen, Pharmaceutische Zeitung, 1908, No. 87.

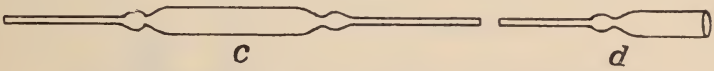
glassware, such as Eimer & Amend, of New York) about nine millimeters or one third of an inch in diameter. At a point two inches from one end heat over a Bunsen or blow-pipe flame, revolving the tubing. When soft remove from the flame and draw out with a firm pull to a capillary tube. Now heat at a point about an inch further down the tube and again draw out. Repeat the operation several times forming a series of tubes of normal size connected with capillary tubes as show in fig. 4. Breaking these apart

FIG. 4.



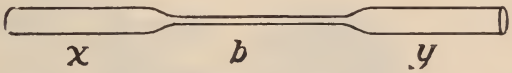
Making tabular ampuls.

FIG. 5.



Steps in the process of making bottle-shaped ampuls.

FIG. 6.



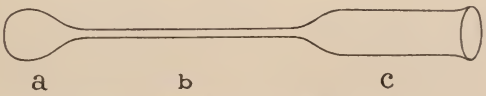
Bottle-shaped ampul with upper portion of tube left attached to act as funnel as proposed by Fisher.

produces finished empty ampuls open at both ends. These ends should be sealed in the blow-pipe Bunsen flame unless used immediately. By carrying the process a step further as shown in fig. 5 the bottle-shaped ampul may be produced; but this requires a high degree of skill as a glass blower. Fig. 6 shows a bottle-shaped ampul with a portion of tube left attached to act as a funnel.

TEST-TUBE AMPULS.

Where Jena normal glass tubing is not available test-tubes may be used as they are generally of better quality of glass than ordinary tubing. Heat a 3 inch test-tube about ¾ of an inch from the bottom, grasp both ends of the test-tube with gas pliers (or test-tube holders) and draw out as shown in Fig. 7, leaving a bulb *a* at the bottom of the tube connected by

FIG. 7.



Ampul Made from a Test-tube.

a capillary tube *b* some 6 or 8 inches long with the upper part *c* which can be used as a funnel in filling the ampul.

CLEANSING THE AMPULS.

The empty ampul usually comes into the market sealed, and is presumably clean and sterile. To wash out the interior scratch the tip with a file and break it off. Put the empty ampuls into a capsule or beaker of water, bring to a boil, remove from the flame and pour cold distilled water on the ampuls as they float in the boiling water. They at once fill themselves. Again bring to a boil when all, or nearly all the water will again be expelled. Now sterilize in an oven at 120° C. if possible.

METHODS OF FILLING AMPULS.

For convenience' sake we may divide the methods of filling ampuls into three classes, (1) by gravity, (2) by pressure and (3) by vacuum.

The simplest form of gravity filler consists of a prescription funnel to

FIG. 8.

Graduated Multiple Filler of Paillard-Ducatte.

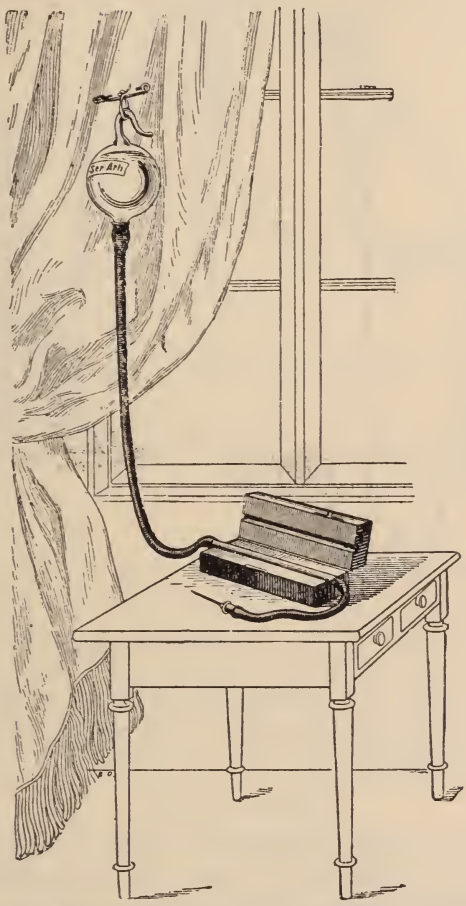
which a delivery tube of glass drawn out to a fine point is attached by by means of a rubber tube provided with a pinch-cock. A burette may also be used in the same way. A kind of multiple burrette is used by Paillard-Ducatte of Paris, (see Fig. 8), under the name of "semplissodoseur" as the delivery tubes are graduated, making it feasible to measure the amount of liquid put into each ampul. Hypodermic needles are used as delivery tubes in the Paillard-Ducatte filler.

Massive injections of normal saline solution, amounting to as much as a liter are injected by gravity from a large ampul as shown in Fig. 9.

The large ampul may also be used for filling smaller ones by providing the delivery tube with a pinch-cock and a fine point.

A modification of this suggested by Pégurier * is shown in Fig. 10. It consists of a large ampul supplied with a pressure bulb and delivery tube,

FIG. 9.



A Liter Ampul Prepared for Injection of Normal Saline Solution.

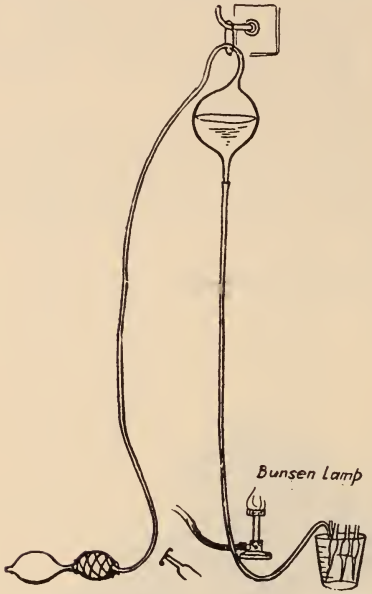
the flow being regulated by a pinch-cock. It will be seen that this involves both gravity and pressure.

The Falck stock bottle, Fig. 11, offers a convenient method of filling ampuls, though the delivery tube would have to be drawn out to a finer point than shown in the illustration. This consists of a wash-bottle *a* provided with a pressure bulb attached to the tube *c* which is filled with sub-

* Chemist and Druggist, January 30, 1909.

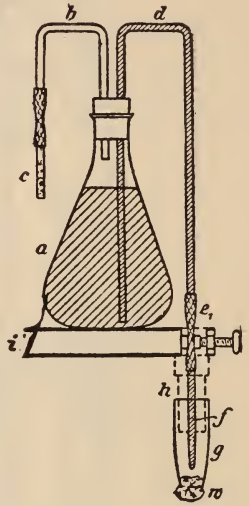
limated cotton to prevent access of germs. The siphon tube *d* being filled by pressure on the bulb the flow is controlled by the pinch-cock *e* which, for giving greater stability, is attached to the shelf. The delivery tube passes down through a rubber stopper *h* over which is fitted a large tube

FIG. 10.



Pegurier's Ampul Filler.

FIG. 11.



Falck Stock-Bottle for Filling Ampuls.

g which can be stoppered at the lower end loosely by a plug of sublimated cotton *w*. This will protect the point of the delivery tube from contamination while not in active use.

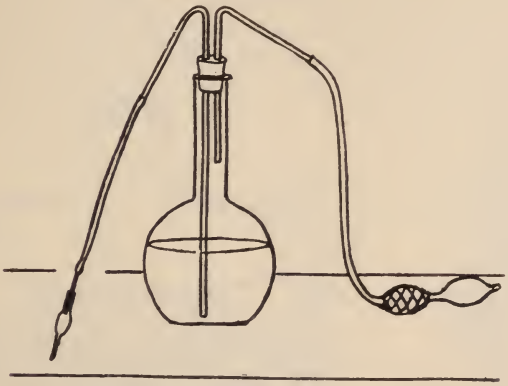
PRESSURE FILLERS.

The hypodermic syringe furnishes a convenient and simple form for filling a small number of ampuls but it is so slow in operation as not to be recommended save as a makeshift. An ordinary wash-bottle may be converted into a pressure filler by providing it with a pressure bulb and a delivery tube as described by Pegurier and shown in Fig 12. The air supply should be filtered through sublimated cotton, stuffed lightly into the tube through which the air supply passes. The delivery tube is of course drawn out to a fine point. An effective, though simple, pressure filler may be made by drawing out the tip of a large-sized medicine dropper to a long, fine point. This is easy to manage and more rapid in operation than the hypodermic syringe.

The tubular ampul may be filled with an ordinary medicine dropper con-

nected with the ampul by means of the rubber tube as shown in Fig. 13. The proportions are wrong in the sketch, as the dropper should be larger than the ampul.

FIG. 12.



Pegurier's wash-bottle ampul filler.

Another form of pressure filler which has been patented in Europe is shown in Fig. 14. This can be used only for filling the tubular ampuls open at both ends. The rubber bulb fits over the top of the flask and on

FIG. 13.

Filling tubular ampul c by means of a medicine dropper a connected with a rubber tube b.

being compressed the contents of the flask are driven upward through the glass tube into the ampul which fits into the upper part of tube.

FILLING BY MEANS OF VACUUM.

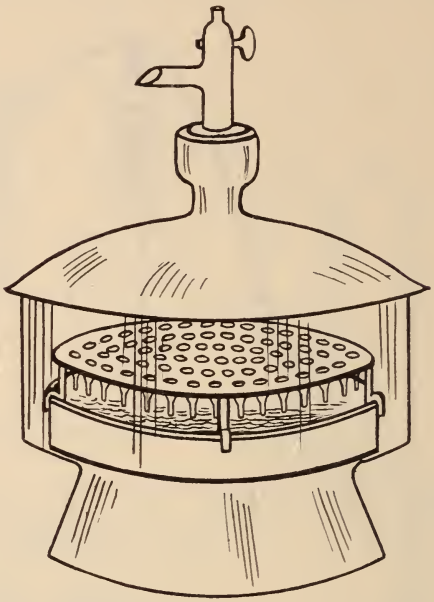
The best method of filling ampuls is that in which the use of a vacuum is involved. Three forms of apparatus are illustrated in which the vacuum is used. That used by Fairchild Brothers & Foster, see Fig 15, consists of a glass desiccator provided with a tubulated cover with ground-glass joint. The sterile liquid to be used is placed in the central glass vessel, the empty flask-shaped ampuls are inserted mouth downward in the holes in a perforated zinc plate so that the mouths open below the level of the liquid. The tubulated cover is connected with a vacuum pump. The vacuum is applied, the air is drawn out of the ampuls and when the pressure is allowed to return to normal the liquid is driven up into them. The zinc plate is then removed, the filled ampuls stood loosely upright in a box,

placed in the desiccator, and the vacuum applied again when the surplus liquid is drawn out of the neck, a very important point.

FIG. 14.

Patented filler for tubular ampuls.

FIG. 15.



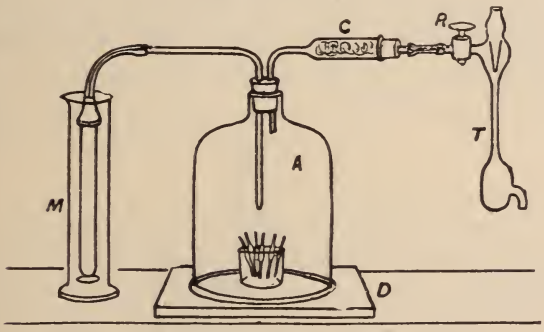
Fairchild apparatus for filling ampuls by means of a vacuum.

In the Eury apparatus (Fig. 16) as described by Pégurier the solution is placed in the beaker *M*, the vacuum pump *t* is connected up with the water supply, the bell jar *A* is placed on a ground-glass plate *D* and the sterilized ampuls with one end sealed and the open end downward are placed in the beaker immediately under the delivery tube. When the vacuum is created the liquid is drawn through the Berkenfeld filter candle suspended in *M* thus being sterilized, and dropped into the beaker. When the vacuum is released and the pressure returns to normal the liquid is drawn up from the beaker ampuls. The entire apparatus, including the ampuls must, of course, be thoroughly sterilized before the operation is begun.

Probably the most convenient and satisfactory method of filling on a small scale is offered by the apparatus described by Spindler in the Pharmazeutische Zeitung for 1908, No. 30, which is shown in Fig. 17. This is made by Auer, of Zurich. It can readily be made by any chemist. It consists simply of a large glass tube provided with a rubber stopper with two perforations. In one of these is fitted a tube to be connected with a vacuum pump. In the other is fitted a tube provided with a Chamberland procelain filter.

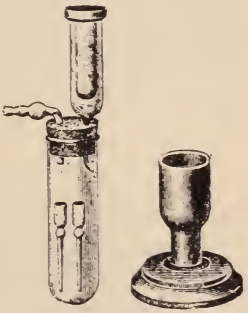
The ampuls with the mouth open are stood, mouth downward, in the apparatus. The whole is sterilized in a steam sterilizer or by dry heat, if preferred, the liquid is poured into the Chamberland filter above, the vacuum applied and when the lower tube has received a sufficient quantity of the liquid the vacuum is released slowly and the ampuls filled by suction. The advantage of this apparatus is that it is small in size, inexpensive to construct, and easy to sterilize so that the use of it is well within the limits of any enterprising druggist. So far as I am aware it is not

FIG. 16.



The Eury Apparatus for Filling Ampuls.

FIG. 17.



Spindler Apparatus as made by Auer.

patented in the United States. I have had such an apparatus made at a cost of about two dollars and for as much more a very good vacuum pump can be purchased.

In filling ampuls with funnel attached as shown in Figs. 6 and 7 first heat the bulb in boiling water, then pour the solution into the funnel when, on cooling the bulb will fill. If it fails to do so heat again to boiling. Where the solution will stand it the bulb may be cautiously heated on the open flame until a little steam forms. On cooling, the liquid from the funnel rushes down into the bulb.

FILLING WITH OILY SOLUTIONS.

Viscid or oily solutions which cannot be handled by gravity methods, or in fact any kind of solution, may be put into ampuls by pouring a few drops of ether into the ampul, heating over an open flame, igniting the ether vapor as it issues from the ampul and as soon as the flame expires, showing the complete evaporation of the ether, plunging the tip into the solution which rushes in to fill the vacuum in the ampul.

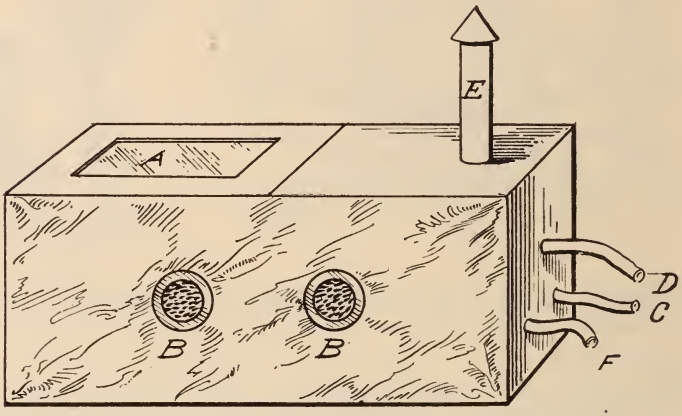
STERILIZATION.

The importance of complete sterilization of the ampuls and their contents cannot be too strongly accentuated.

Much care must be exercised at every stage of the operation of making

solutions and filling them to insure complete sterility. The utensils, the solvents and the substances used must be sterilized and protected from contamination. The air in the ordinary dispensing room is generally charged with germs so that solutions prepared in it will probably not be sterile. This difficulty may be overcome by the manufacture of an aseptic hood consisting of an air-tight box provided with a glass window in the top and a glass side through which light may be admitted, the front being composed of rubber cloth with arm holes through which the hands of the operator may be thrust. A Bunsen burner should be in the hood with suitable outlet for the gases and in this way the process of filling and sealing may be carried on aseptically. Such hoods are used by bacteriological workers, see Fig. 18.

FIG. 18.



Aseptic Hood in which Ampuls may be Filled and Sterilized.

The farther side and the window in the top *A* are of glass. The front is of rubber cloth with arm holes *BB* through which the operator slips his hands and which are provided with rubber bands. The tube *C* admits the gas for a Bunsen burner and *D* connects the Spindler apparatus shown in Fig. 17 with the vacuum pump. The products of combustion pass off through the chimney *E* and air is supplied through the tube *G* which is loosely filled with sublimated cotton so as to filter the air supply.

Where the porcelain filters are used, as in the Fairchild, the Eury and the Auer apparatus great care is required to make sure that the filters are thoroughly sterilized and that the filtrate is sterile. In handling animal extracts full of proteid this is particularly important and Fairchild Brothers & Foster make a bacteriological examination of each batch of serum or liquid before putting it into ampuls, to make sure that it is completely sterile. Notwithstanding the exercise of the greatest care in sterilizing the filters, they occasionally find it necessary to reject a batch and have it resterilized.

In the preceding references this question of sterilization has not been dealt with, but merely the question of filling. In the last three methods of filling referred to, in which the ampuls are filled by means of a vacuum, the solution may be rendered sterile by filtration through the porcelain filters. With the other methods there is danger of contamination during the process of filling, even if the solution is completely sterile to start with. It is therefore necessary to sterilize these filled ampuls after they are filled and sealed. Where the contents are not affected by heat this can be done by putting the filled ampuls into a steam sterilizer, such as an ordinary Arnold sterilizer. With drugs affected by heat there is danger of decomposition at this temperature and Tyndallization or intermittent sterilization must be resorted to. In these cases the ampuls should be heated to 60° C. for half an hour at intervals of twenty-four hours for three or four consecutive days.

SUBSTANCES DECOMPOSED BY HEAT.

Hager names the following substances as liable to decomposition at the boiling-point of water : atropine, cocaine, hyoscine, scopolamine, duboisine, physostigmine, atoxyl, and ergot solutions. Dr. Beysen says that acid hydrochloride of quinine and urea is also liable to be decomposed. It is true that cocaine solutions have been heated to the boiling temperature without decomposing, but the prolonged heating for sterilization incurs danger of decomposition. My own observation proves that a simple boiling of the sealed ampuls for half an hour is not sufficient to kill the germs of staphylococcus pyogenes aureus. In any case, therefore, repeated sterilization on several successive days is desirable where feasible. The addition of half of 1 per cent. of phenol would not be open to objection therapeutically and would prevent the germination of any spores left in the solution.

Candussio * has observed the formation of a precipitate in liquid extract of opium sterilized in an autoclave at 112° C. as well as when sterilized at 100° C. Estimation of the morphine content showed that this precipitation was due to the action of heat on the resins and extractives and did not affect the quantity of alkaloid. He therefore proposed sterilization of the extract and decantation before putting into ampuls. He recommends the same procedure with extract of ergot.

To adequately treat of the subject of sterilization would unduly expand this paper. Those wishing to take up the subject from the pharmacist's stand-point will find much of interest in a little French manual on the subject published by Balliere.

THE PREPARATION OF STERILIZED GELATIN SOLUTION.

As pointed out by Forrester † gelatin is being increasingly used by

* Pharmaceutische Post, 1908, No. 96.

† *American Druggist* October 11, 1909.

physicians in Europe as a hæmostatic. It is generally employed in 10 per cent. solution administered hypodermically. Great care must be exercised in sterilizing these solutions as death has followed from the injection of solutions containing tetanic poison. The Swiss Pharmacopœia demands that the gelatin used shall first be tested on guinea pigs for the presence of pathogenic bacteria. Being proved sterile, the solution is made, boiled, filtered, filled into ampuls, sealed, and sterilized at 212° F. for fifteen minutes on three successive days, being left between whiles in an incubator at 98° F. After final sterilization they are stored in an incubator at 98° F. for one week and all tubes showing a growth are rejected. They are again stored for one month and samples are injected into guinea pigs and mice when, if no untoward results are observed they are considered as suitable for dispensing.

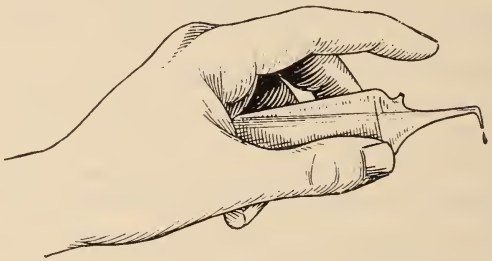
TO TEST THE SEALING.

In sealing the point of the ampul, it is not always easy to make sure that the sealing is perfect. This can be readily tested by boiling the filled ampuls in a solution of methylene blue.* In case the tubes are imperfectly sealed the color will show in the contents of the ampul.

CLEANSING THE TIP OF THE AMPUL.

Where the solution contains considerable quantities of organic matter there is danger that sufficient of this will adhere to the inside of the capillary tube to char when the tube is sealed. This can be obviated by

FIG. 19.



Dropper Ampul for Dispensing Chloroform.

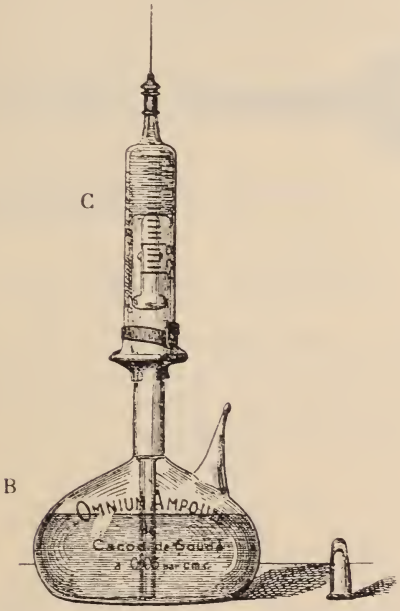
making the solution half strength, putting in half the required quantity and filling up with distilled water, thus washing down the inside of the tip. It has also been suggested that the tip may be cleansed by inserting a feather previously dipped in sterile water. With the Fairchild apparatus the filled ampuls are returned to the apparatus mouth upward, the vacuum applied, and any residual liquid thus drawn out of the neck.

* Beysen, Pharmaceutische Zeitung, 1908, No. 87.

SPECIAL FORMS OF AMPULS.

In addition to the forms of ampuls already illustrated there is a wide variety of shapes used for special purposes. The dropper ampul shown in

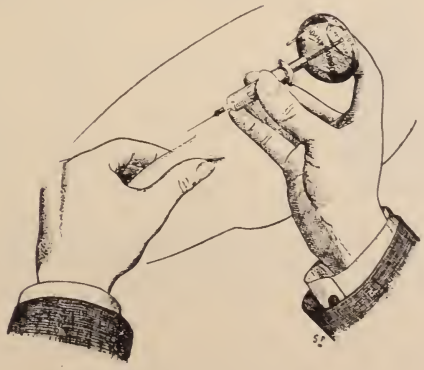
FIG. 20.



Omnium Ampul and Syringe Combined.

Fig. 19 has been introduced by Parke, Davis & Co., for dispensing chloroform, each ampul containing 30 Cc. of the drug for producing anæsthesia.

FIG. 21.

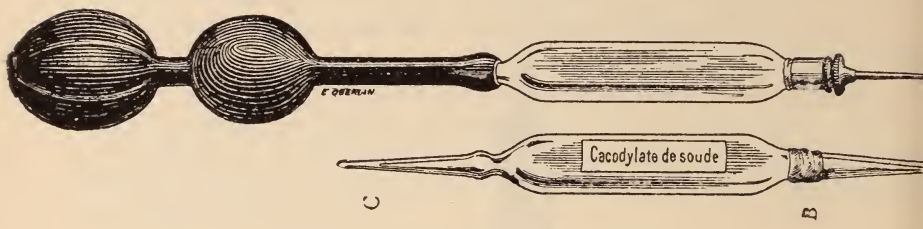


Method of Using Omnium Ampul.

Fig. 20 shows a French ampul in which the ampul and syringe are combined. The method of applying this is shown in Fig. 21. Somewhat

similar forms have been introduced into the United States for use in dispensing antitoxin. A special form of ampul which can be used as a hypodermic syringe is also shown in Fig. 22. This too is of French origin, being made by Chevretin et Lematte of Paris.

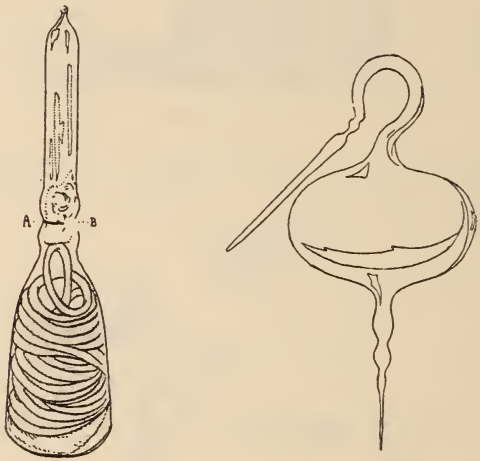
FIG. 22.



Ampul Used as Hypodermic Syringe.

Paillard-Ducatte, one of the largest manufacturers of filled ampuls in Paris, puts up large ampuls as shown in Fig. 23 of normal saline solution and also puts up in a sealed tube a sterilized rubber tube with hypodermic needle as shown on the left in Fig. 23.

FIG. 23.



Sterilized Rubber Tube with Hypodermic Needle put up in Sealed Glass Tube Ready for Use in Injecting the Sterile Saline Solution Contained in the Large Ampul on the Right.

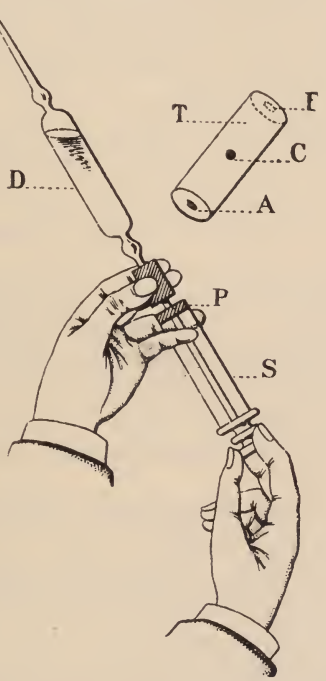
Dumesnil, of Paris, makes an ampul and syringe which he connects by means of a rubber plug as shown in Fig. 24. The tubes of concentrated spirit of nitrous ether and those of ethyl chloride used for local anæsthesia sold under the name of "Kelene" are in fact special forms of ampuls.

As will be seen there is an endless variety in size and forms of ampuls in use.

THE COMMERCIAL ASPECTS.

Up to the present time this method of dispensing has not become popular in the United States, save for the serums and animal secretions and extracts. Fairchild Brothers & Foster put up several of these animals extracts which have attained a considerable degree of popularity. The Kny-

FIG. 24.



Dumesnil's Special Ampul and Syringe.

Scheerer Company, of New York, have placed a complete line of the ordinary hypodermic solutions on the market in sealed ampuls. Sharp & Dohme, the H. K. Mulford Company, and Parke, Davis & Co., put up a few specialties in this form. Burroughs, Wellcome & Co., have patented a form of ampul with a vase-like base to which they have given the name vaporula. Martindale of London calls his filled ampuls sterules. Lehn & Fink have quite recently placed on the market a line of the solutions which are most popularly used in the United States for hypodermic injections. These sell to the retailer at 40 cents a dozen.

The lists of foreign manufacturers show a wider variety of solutions, including salts of quinine and of iron which with us are not used hypoder-

mically. The French and the Italians have made very general use of this form of medication which is as popular in the Latin countries of Europe as is the tablet in the United States. We doubt if the tablet will ever give way in popularity to the more expensive and more cumbersome ampul for general use in the United States. As a matter of fact the principal danger of infection in the use of ordinary hypodermic injections comes not from the solution but from the syringe of the physician who does not use sufficient care in sterilizing it before putting it into use.

I am indebted to the publishers of the American Druggist for permission to use several of the illustrations which appear in papers by me in that journal for December 13, 1908 and February 22, 1909.

The following articles will be found of interest by any one wishing to make a further study of the subject:

Sterlization in Pharmacy, by Reginald R. Bennett and W. J. Uglow Woolcock, Pharmaceutical Journal and Transactions, March 27 and April 10, 1909.

La Sterilisation en Pharmacie, L' Union Pharmaceutique, pages 205, and 253, 1909.

Sterilisatie in de Receptuur aan de hand van de Voorschriften in eenige Hieuwere Pharmacopeeën, Pharmaceutisch Weekblad, page 645, 1909.

Zum Artikel "Sterilisation" der Pharmacopoea Helvetica IV. J. Thomann, Schweizerische Wochenschrift für Chemie und Pharmazie, January 16, 23, and 30, 1909.

Die Herstellung von Injektionen in Ampullen, M. Grübler, Pharmaceutische Post, No. 44, 1909.

Die Sterilisation in der Pharmacopoea Helvetica IV. M. Grubler, Pharmaceutische Post, No. 51, 1907.

Die Sterilisation, M. Grubler, Pharmaceutische Post., 1908.

Die Wirkung von freiem Alkali auf Morfium und Adrenalin, M. Grubler, Pharmaceutische Post, No. 33, 1907.

Nochmals die Sterilisation im Apothekenbetriebe, Dr. Richard Firbas Pharmaceutische Post, 1907.

Zur Frage der Anwendung von Komprimirten Arzneitabletten. Dr. Erhard Glaser; Allgemeine Militäräztliche Zeitung, Medizinische Klinik, No. 8, and No. 9, 1909.

PEPSIN AND PANCREATIN: THEIR CHEMISTRY AND USES.

BY BERNARD SACKS, M. D.

Pepsin, U. S. P.—A proteolytic enzyme obtained from the hog, capable of digesting not less than 3000 times its weight of freshly coagulated and disintegrated egg-albumen.

Pancreatin, U. S. P.—A mixture of enzymes (containing trypsin, amylopsin, etc.), and capable of converting not less than 25 times its weight of starch into soluble substances.

To the average pharmacist these definitions do not convey any definite idea at all. What is an enzyme? How does an enzyme act? What soluble substances are produced by the action of the enzymes upon egg albumen or starch? In case of disease what medicinal benefit is derived from introducing enzymes from the stomach of the hog into the stomach of man.

The pharmacist dispenses daily many preparations containing pepsin and pancreatin. In order to do so intelligently, he ought to be able to answer the above questions to his entire satisfaction.

Scientific pharmacy is not only the act of preparing and dispensing of medicines; it is something more than that. If the pharmacist knows the preparations he handles only by their labels, he is reduced to the status of that doctor, who prescribes pepsin because it is good for the stomach.

The subject of the digestive process of the three great groups of foodstuffs, proteids, carbohydrates and fats, has been elaborately worked out by the great scientists of the present-day, E. Fisher, Pavlow, Voit, Atwood and many others, so that from a merely theoretical study, the subject has been placed upon a practical laboratory basis, and experiments in animal digestion can be as easily and accurately performed as the experiments with the inorganic reagents in test tubes.

Food substances introduced into the digestive mechanism of man either in their raw state, or previously prepared by cooking etc., must undergo a series of changes so that from highly complex, insoluble, undiffusible material, simple bodies are formed which can be appropriated for the nutrition of the living body.

These changes are of a chemical nature, and are subject to all chemical and physical laws similar to those taking place in chemical reactions outside of the body. Some of the food substances require very strong reagents—as boiling with dilute alkali or acids—so that they can be broken down in the test-tube. These strong reagents would prove detrimental to the living body, hence certain modified conditions must be provided for them. You cannot, for example, fuse protein substances in the stomach with lime or soda; or subject them to the action of superheated steam; or subject them to prolonged boiling with dilute acids or alkali. Hence in order to carry on digestion in the living body nature has provided, by the law of supply and demand, certain substances called enzymes, or by their old names, ferments, which carry on the chemical reactions taking place in it.

All life processes are of chemical nature. All chemical reactions that produce life are carried on by the agency of enzymes.

I intend in this paper to take up the proteid substances of the food and the enzymes that act upon the proteid food.

Properties of the Enzymes.—Enzymes in general are bodies produced by the vital activities of cells for the purpose of aiding and bringing about the chemical reactions taking place in them.

Then enzymes act upon the food substances; and as the food substances are of various kinds, so we also find various kinds of enzymes, each variety acting only upon a given variety of food. Hence the enzymes are *specific* in their action. Those that act upon proteids are called proteolytic enzymes, as pepsin and trypsin; those that act upon carbohydrates are called amylolytic enzymes, as diastase and ptyalin; those that act upon fats are called lipolytic, as steapsin. Enzymes act best at the body temperature. Higher or lower temperatures either inhibit their action or actually destroy them. Each variety requires a certain medium: some enzymes acting best in acid solution, others in neutral or alkaline solution. Enzymes are soluble in water and in glycerin forming not a true solution but a kind of colloidal suspension. They are precipitated from solution by alcohol, tannic acid, neutral salts, as ammonium or zinc sulphates and by the salts of the heavy metals. These points should be remembered in order to avoid incompatibilities. Enzymes are contained in the various digestive juices produced by the activity of certain glands. These glands must be in a healthy condition. The healthy condition of one part of the body depending upon the healthy condition of other parts of the body, it follows that the whole organism must be in perfect condition in order to produce normal digestive juices.

The secretion of the juices is regulated by the central nervous system; hence the central nervous system must be in a normal condition in order to produce a normal supply of juices. Some enzymes, the proteolytic at least do not exist in the glands as such, but are found there as pro-enzymes, which are inactive. They are rendered active by another type of enzymes, called kinases. The presence of kinases is as much necessary as the presence of the pro-enzymes.

It is thus seen that there are many influences at work in the normal production of enzymes, and the above data may well be carried in mind in the preparation, dispensing and the prescribing of artificial digestants.

The chemical composition of the enzymes is not known, because they have never been prepared in the pure state. There is no way, for example, of testing the quality of active enzymes in a pepsin solution. The strength of pepsin preparations can be only determined by comparing the action of a given sample with the action of a pepsin solution taken as a standard. The commercial pepsins aud pancreatins, etc., vary greatly in strength, according to the mode of preparation and preservation.

Properties of the Proteids.—Proteid substances, as found in the meats, milk, etc., are the most important bodies that are necessary to carry on life. They are composed of all those elements that go to make up the animal body: C.H.N.O.S, in different proportions and different molecular arrangement. They have though many properties in common: they all give certain precipitation tests with the same reagents, and give common color reactions, as Buiret, Millon's and others. They are colloidal sub-

stances, only slightly diffusible through animal membranes. Their molecule is very large, hence they are very unstable. Their molecular weight ranges from 2,500 to 20,000.

The nitrogen, which is their most important constituent, exists in them in such condition that on cleavage it appears as amino-compounds, fatty acids containing the group NH_2:

CH_2NH_2COOH = glycocol, CH_3CHNH_2COOH = alanin, etc.

According to Hofmeister the proteid skeleton consists of a number of amido-bodies linked together by a chain of amino-groups:

$$\begin{array}{l} \text{—NH.CH.CO—NH.CH.CO—NH.CH.CO—} \\ \quad\quad\quad\

$$C_3H_5(C_{18}H_{35}O_2)_3 + 3H_2O \xleftarrow{} C_3H_5(OH)_3 + 3(C_{18}H_{36}O_2)$$
Tristearin Water + Enzymes Glycerin Stearic Acid.

It is very possible that reversible reactions take place in the living body when the organs are diseased and their motility is impaired, or when large quantities of enzymes are introduced with small quantities of food.

Chemistry of Digestion.—Introduce into a test-tube some freshly coagulated and disintegrated egg albumen or simply boiled white of egg. Add some natural or artificial gastric juice—pepsin and hydrochloric acid 0.3 per cent. After a variable length of time, depending upon the temperature of the room and efficiency of the juice, the edges of the white of egg become swollen, translucent and then dissolve.

The hydrochloric acid first unites with the albumen, forming acid albumen or syntonin; then as the reaction proceeds, proteoses and peptones are formed. These substances can be tested for as follows:

1. Primary proteoses respond to all proteid tests, give the biuret and xanthoproteid color reactions. They are precipitated from the solution by the addition of ammonium sulphate in substance to saturation.

2. Secondary proteoses give the usual proteid reactions, but are precipitated from solution by half saturation with ammonium sulphate.

3. Peptones do not respond to all proteid reactions, showing that the proteid molecule has been largely split. They are precipitated by iodo-potassic-iodide and phospho-tungstic acid.

4. Many intermediate bodies, called by E. Fisher polypeptids, are formed before the final end-products appear. They are precipitated by phospho-tungstic acid, but no longer give the biuret reaction.

The peptones and polypeptids are supposed to be the active ingredients of the so-called peptonoids and pareopeptons; see if they do so.

Digestion in the living body is carried on in the mouth, stomach and intestines. In the mouth, besides being mechanically reduced by the teeth, the proteid food does not undergo any changes. The only enzyme contained in the saliva is ptyalin, and this acts only upon starch. In the stomach the proteids meet with the pepsin-hydrochloric acid. The hydrochloric acid is as important, and may be more important than the pepsin. Not only is an acid reaction necessary for the pepsin, but the hydrochloric acid previously unites with the proteid, renders it translucent —preparing it thus for the action of the pepsin. Moreover, an acid reaction is absolutely necessary in order to start up the flow of the pancreatic juice. The stomach is set in vigorous motion, and from time to time expels into the intestine small portions of partially digested food of an acid reaction. In the small intestine the acidity is quickly neutralized. The food mixes with the pancreatic juice and at once active proteolysis begins. The trypsin is not only an enzyme that works quicker, but its action is more complete than that of pepsin. Only partial digestion takes place in

the stomach. The material ejected from it still gives all proteid tests and color reactions; peptones, if any are formed, are few; polypeptids are not found at all. After the action of trypsin we find the bodies that no longer give the biuret reaction, the polypeptids of Fisher.

The polypeptids now meet in the small intestine with another enzyme, erepsin, which is produced by the small intestine proper. The erepsin causes final cleavage, and the amino-bodies now appear.

These soluble, crystallizable bodies easily pass into the blood, being absorbed by the process of diffusion and osmosis.

The final fate of the amino-bodies is as follows: The amino-bodies are carried by the blood to the tissues where the NH_2 group is oxidized, forming ammonia, NH_3. The ammonia unites with the CO_2 which is always present in the tissues, forming ammonium carbonate and other ammonia compounds which are poisonous in nature. The ammonium carbonate is carried by the blood to the liver where it is converted into urea by dehydrization:

$$\begin{matrix} NH_4 \\ \\ NH_4 \end{matrix} > CO_3 — H_2O = CO < \begin{matrix} NH_2 \\ \\ NH_2 \end{matrix}$$

Here we meet again with the NH_2 group, but it is now in a soluble non-poisonous state. When the liver is diseased and detoxication of the ammonia compound does not take place properly—the ammonia accumulates in the blood and produces toxic symptoms. In this state the urine will show an increase of the ammonia nitrogen and decrease in the urea nitrogen. This so-called nitrogen partition is to be taken in consideration when analyses of urine are made. Part of the proteid molecule is oxydized into uric acid and is excreted by the kidneys in the shape of soluble urates.

Therapeutics and Pharmacology.—Digestion in the living body varies somewhat from hydrolysis in test tubes. Not only are the conditions different—but here comes into play the influence of a nervous system.

Digestion is a complex process—taking place in several organs, which must work mutually together and depend one upon the other. Part of the digestive process, that is as far as the stomach goes is under the influence of the will. The taking of the food into the mouth, its chewing and swallowing are all voluntary acts. But as soon as the food has reached the stomach voluntary action stops and further digestion is carried on automatically in an orderly purposeful way.

The voluntary act is subject to many physical and psychical influences. In order to partake of food you must have appetite. At the sight of food one either gets "watering at the mouth" or complete disgust for it. If the food is taken cheerfully one gets a cheerful flow of saliva and at the same time a cheerful flow of gastric juice and so on. Food taken without appetite is poorly digested because the nervous system not having been

properly stimulated fails to set up properly the digestive mechanism. The involuntary mechanism depends upon the voluntary; besides, it is influenced by the condition of the several organs concerned in it; by the general condition of the body as a whole; and by the condition of the nervous system.

A highly complex mechanism tends to easily get out of order and requires great skill to put it back into proper shape once it gets out of order. The means employed to correct diseased conditions are medicinal and surgical.

Medical treatment consists in adding certain substances to the digestive tract, which may be lacking there.

Surgery does not add anything. If surgery accomplishes any thing it is by taking away "something from the digestive tract."

Medicinal substances are introduced into the stomach to excite the flow of natural juice. If, by excitation any flow of gastric juice is obtained, especially continued excitation, it is far from being a normal gastric juice. Again, if the glands of the stomach are diseased no amount of excitation will produce any flow of juice, since there is nothing to excite. The other way is to add artificial juices in the shape of preparations of pepsin, pancreatin and papain.

A person with an analytical bend of mind will not fail to notice that in almost all diseases of the digestive tract the warfare is carried on chiefly against the stomach. The poor stomach is washed and pumped, and stuffed with test meals and burned with silver nitrate and dosed with medicines. The truth is that the best treatment would be complete rest of the stomach and starvation.

Then as we said, peptic digestion is after all only of secondary importance. Its value is not as much as to aid the tryptic digestion. In diseases of the pancreatic gland very little can be accomplished by stomach alimentation; while the stomach was totally removed and the patient was not any worse for it.

Pepsin Preparations.—In looking over the vast amount of artificial digestants one is struck by the great number of pepsin preparations, while those containing trypsin are comparatively few. The great Munyon's Paw-Paw is a representative of the papain group. Of erepsin very little is known even by those, whose business it is to know it. Pepsin, on the contrary, is well known to everybody. Its name is quite as popular as the disease bearing its name, dyspepsia. Pepsin is exhibited in a most fanciful variety of ways: Essences, elixirs, wines, cordials, chewing gums, tablets, etc., flood the market. It is extensively advertised to the medical profession and to the public at large, and these generously respond to the call and enthusiastically indulge in prescribing and consuming great quantities of the stuff, while the poor hog pays for it by its life.

The scientific physician endeavors to recognize and treat disease in a thoughtful conscientious manner. He studies each case and studies each

remedy. Quite a number of physicians however take things for granted. Study requires a certain amount of work, and work is tiresome.

The physician's knowledge of the nature and action of drugs is expressed in the way he prescribes them for disease. Writing of proprietary prescriptions does not require any knowledge at all. A young physician prescribes a proprietary pepsin remedy. He knows what it is, since he received a sample of it. He knows its indications since he read the pamphlet attached to it. He also learned something about pepsin, etc., at the medical school. But that was a couple of years ago and all that theoretical nonsense has been long ago supplanted by practical experience. It is the young physician who is easily caught and enslaved by the patent medicine people.

Either due to lack of time, or lack of interest on the part of the faculty —the medical student receives only a very limited knowledge of the materia medica, while the proprietary people are very particular to fill up the breach and familiarize the young physician—and even the student at college—with their preparations both by samples and literature.

The old physician, of course, knows it all. But he prescribes patent medicines because he does not care to bother his head with writing out a prescription ; or he is too busy with his extensive practice and has not the time ; or he is afraid to trust the druggist with its preparation.

Well, a young ignoramus may live long enough to become an old ignoramus and will obstinately cling to his old habit no matter what you do to him.

As for the so-called ethical prescriptions. I have before me a bunch of prescriptions calling for pepsin, pancreatin, etc., that have accumulated during several years of my practice as a pharmacist. To say the least, some of them do not display any great amount of brilliancy in the knowledge of physiological chemistry and therapeutics : Pepsin is prescribed in alkaline solution ; pancreatin in acid solution. Sometimes all the enzymes in the calendar are found in the same prescription. Some mixtures contain more alcohol than Peruna, so that the action of the enzymes is not only inhibited but totally destroyed. In some mixtures the quantity of pepsin and hydrochloric acid is so great, that it is wonderful how the medicine does not digest the stomach itself. Then the chemical incompatabilities :

Essence of pepsin and mistura rhei et sodæ is one of the most favorable prescriptions. You are called to fill a prescription containing essence of pepsin (X & Co.) and elixir alkaline (Y & Co). You mix them without much thinking about it. The acid of the essence combines with the bicarbonate of the elixir and carbon dioxide is evolved. The bottle either bursts on the counter spoiling some goods, or it bursts into your face or that of the customer and spoils, well—some blood.

I received only a few days ago a prescription written up by a veritable

fountain of knowledge and calling for, among several other things, essence of pepsin (Fairchild) and silver nitrate.

The pharmaceutical preparations of pepsin vary widely in their efficiency. I have collected several samples of the essence of pepsin: Some of the proprietary variety, some I bought from different drug stores, some of my own preparations made according to different formulæ. I placed them in test-tubes with some freshly-boiled white of egg and some fibers of meat. I placed them as nearly as possible at the temperature of the human body, vis. 37° C. The results obtained prove more than anything else that the efficiency of the essences is not as great as it is claimed to be. Try this for yourself. Do not be mislead by the loud labels and convincing literature of the patent medicine firms. It is foolish to expect to cure a disease that baffles a specialist by means of an essence of pepsin or elixir lactopeptin.

Still the pharmacist and the physician must accept some of the bluffs of the advertisements because they have no way of proving the opposite. The tests given in the books are very intricate, very difficult to apply with the limited means at hand. The text is full of technical terminology, and so proves to be of no practical value to the pharmacist. The main point, I contend, is: Since the pepsin preparations do not possess such wonderful properties as they are supposed to, it does not make much difference whether a given preparation belongs to the nobility and wears a title or is simply a plebian preparation of the U. S. Pharmacopœia.

There is at present a tendency on the better part of the medical profession to do away with the old empirical way of treating diseases. Blind faith in drugs has given place to clear, scientific medicine, based upon laboratory experimentation and clinical experience. If a given physician still adheres to prescribing medicines, both proprietary or ethical, without due thought and consideration, he does so because he don't know any better, or he don't care to know any better. The proprietary evil is not that it takes away the profits from the physician and pharmacist, but that it takes away from them the necessity of individual thought and converts them into automatic machines that throw out their goods when you deposit the coin.

Much is said about the inefficiency of the pharmacist to prepare adequate essences or elixirs. A pharmacist, for instance, prepares an essence of pepsin of variable efficiency and places it in a bottle on the shelf for future use. When an occasion arrives to use it for a prescription, the preparation not only has become inert, but has proven to become a suitable culture medium for various micro-organisms.

Now the Comp. Digestive Elixir N. F. I don't know what or how much it digests, but I know that the principal virtue that some of these elixirs possess is their beautiful red color. But you cannot cure stomach diseases by means of tincture of cudbear.

It is the duty of the pharmacist to help along the physician in his noble fight against the degenerative influences of various medical and pharmaceutical fakirs. The pharmacist should know something about the substances that he handles, even if it takes him out of the narrow boundaries of practical pharmacy. He must acquire some special knowledge and apply it to practical work. The pharmacist should be prepared to talk physiological chemistry to the patient and to the doctor, if the doctor is in need of it.

The study of physiological chemistry, instructive as it is, will not only aid the pharmacist in his business, but will make him a better man. The study of the living body, the study of man by man, is so charming and interesting that the pharmacist can well afford the time spent in it.

IMPROVED AND ORIGINAL FORMULAS.

BY ABRAHAM WEINSTEIN.

Being a strong advocate of official preparations, I can not refrain from pointing out a few improvements which may be made in some of the formulas contained in the N. F.

The fact that I am a member of the A. Ph. A. and its branch is evident in itself that the spirit I am animated by to pass these remarks is purely progressive and due to the teaching of our mother Association, the motto being "improve, and advance improvement for the benefit of all."

UNGUENTUM RESORCINI COMPOSITUM.

This preparation is very much improved by replacing the oil of cade with oil of birch tar (oleum betulinum crudum, Dagget), as the odor of cade is very offensive and objectionable to the patient. The physician, therefore, prefers the proprietary ointment, which is of a pleasant odor. The difficulty of making a smooth ointment may be removed by using *powdered* resorcine and zinc oxide, which is made by a dry process and known as "flowers of zinc." The following formula makes an ointment superior to the "proprietary," but looks the same:

Resorcinol	6 parts.
Zinc oxide (by dry process)	6 parts.
Bismuth subnitrate	6 parts.
Oil of birch tar (betulinum crudum, Dagget)	6 parts.
White wax	10 parts.
White petrolatum	28 parts.
Hydrous wool-fat	38 parts.

Rub the powders with part of the previously melted wax, petrolatum and hydrous wool-fat until a smooth paste is obtained, add the rest and stir until cool.

UNGUENTUM SULPHURIS COMPOSITUM.

I would suggest a foot-note to read: "Care must be taken in ap-

plying this ointment on the face, as the green soap, which contains potash, is a violent, deeply-penetrating caustic, and liable to injure the face." In my experience I know of two cases where the ointment was prescribed for removing blackheads, and the result was an inflamed and irritated face, which required treatment by a physician for two weeks. In the second case I called the physician's attention to my experience of the first, but he was indignant and ordered me to dispense as prescribed, but came to see me in a few days and regretted he did not heed my warning, as he lost his patient.

MIST. PECTORALIS STOKES.

Whenever this preparation was made in my absence it was never made right, as the fluidextract of squill was not neutralized properly with ammonia water. Being that the N. F. does not give the quantity of ammonia required, I find that it requires 28 Gm. of ammonia water to neutralize 70 Gm. of acetic fluidextract of squill, but it varies as the strength of the acid in the fluidextract varies. I therefore think that much trouble would be avoided if the alcoholic fluidextract of squill would be used as in the old formula.

VINUM CARNIS ET FERRI.

I find the direction of the N. F. to distil off the alcohol unnecessary, as the finished product without distilling off the alcohol is not near the alcoholic strength required by the British Pharmacopœia for sherry wine, which is 20.34 volumetric per cent.

The following makes an excellent tasteless and ever-ready formula for dispensing castor oil:

Castor oil	12 ounces.
Fluidextract of licorice	½ ounce.
Fluidextract of sarsaparilla	3 drachms.
Glycerin, sufficient to make	16 ounces.

Flavor with oil of peppermint, oil of anise and oil of lemon, each eight drops. The mucilaginous character of the licorice and the glycerin helps to keep the castor oil in suspension. If I may judge from the sale of this preparation, it is very much liked. I dispense one ounce with a little carbonated water for 10 cents. I also put it up in two-ounce bottles and charge 25 cents, under a plain label, "Prepared Castor Oil."

696 Union Ave., New York, May 27, 1909.

GLYCERITUM IODI.

BY FRANKLIN M. APPLE, PH. G.

Brevity has been designated as the soul of wit, and, similarly, simplicity may be regarded as the advance agent of accuracy, hence I will recommend that the formula for Unguentum Iodi U. S. P. be altered to read:

Glycerite of iodine	20 Gm.
Benzoinated lard	80 Gm.
	100 Gm.

As this ointment is directed to be freshly made when required, and as it is more frequently prescribed in small amount in combination with other medicated ointments than in any other way, the process for preparing it should be made more simple, which can readily be accomplished by admitting to the official preparations glycerite of iodine, which represents exactly the quantities directed to be employed in preparing Unguentum Iodi U. S. P., as the following formula will demonstrate:

GLYCERITE OF IODINE.

℞	Iodine	20 Gm.
	Iodide of potassium	20 Gm.
	Glycerin	60 Gm.
		100 Gm.

As the official tincture of iodine contains potassium iodide to render it more stable, I have no doubt whatever concerning the stability of the proposed glycerite of iodine, hence can see no disadvantages to this proposed alteration and addition to our list of official preparations.

If called upon to dispense an ointment which calls for ʒi of ung. iodi in ℥i of finished product, no one can question the greater accuracy of the finished product and the lesser amount of time required to compound the same when the modified formula is followed, and all these advantages can be gained by the simple course suggested.

A comparison of the proposed glycerite with the official glyceritum acidi tannici will show a striking similarity in method of preparation, minus the heat, and will also offer a precedent in justification of the proposed action. Certainly if we are justified in having formulæ for such simple mixtures as glycerite of phenol, liniment of chloroform, spirit of ether, spirit of camphor, etc., etc., which are supposed to be kept in readiness for quick dispensing, the proposed preparation of iodine has some excuse for its proposed birth. As previously stated, simplicity may be regarded as the advance agent of accuracy.

TINCTURA DELPHINII CONSOLIDAE.

BY CURT P. WIMMER, PHAR. D. NEW YORK CITY.

Tincture of Larkspur Seed is, undoubtedly, one of those preparations which are often called for and widely used, for which, however, a satisfactory method of preparation can not readily be found.

Many pharmacists, therefore, take recourse to a fluidextract, prepared by some wholesale house, and dilute it to make their tincture. Even then they find, that the preparation is not a satisfactory one, that the tincture turns out turbid or becomes so on standing.

Of ten samples of Tincture of Larkspur, purchased in the market, only two were found to be clear, the others ranged from very cloudy to slightly turbid, the colors varied from colorless to bright yellow. The general composition of these tinctures differed as widely as the appearance, the alcohol content varied from 10 to 92 per cent., three samples contained acetic acid.

In trying to find a suitable menstruum for preparing this tincture, the author had in mind the general requirements which make a menstruum a desirable, or, if possible, an ideal one, namely first, that it dissolves all or nearly all of the active ingredients, second, that it dissolves as little as possible of the undesirable principles and third, that it produces a product of good appearance and keeping qualities.

Tincture of Larkspur Seed is, to my knowledge, not given internally, it is used externally as an insecticide, and has, especially in cases of Phthiriasis inguinalis, acquired a wide and well-deserved reputation as an effective remedy.

Looking over the literature on Larkspur, only little information as to its constituents can be had. Hopkins found fixed and volatile oils, resin, gum, gallic acid and salts of potassium, iron and calcium. Wicke obtained aconitic acid from the expressed juice, Hager states that the seeds contain an alkaloid, Calcatripin; it is assumed, in general, that the alkaloids of Stavesacre, namely Delphinin, Delphinoidine and Delphisine, are also present in Larkspur. I have not been able to find an account of an exact phytochemic examination of the seed.

It is necessary, first of all, to settle the question as to what the insecticidal action of the tincture is due to. There is no doubt in my mind that this specific action is, in a large measure, due to the fixed and volatile oils, which are present in the seed in more or less abundant amounts. While the alkaloids, taken internally, have decided action, due to their irritant nature, their value as insecticides is questionable, and their importance for a preparation used externally is only secondary.

Working on the supposition, that primarily the oils and, secondarily the alkaloids are responsible for the action of the drug, it would seem that a seed containing a high percentage of fatty matter is the best to employ for the manufacture of the tincture. In various samples of larkspur seed examined, I have found as little as 5 per cent. and as much as 28 per cent. of fat. I do not advocate the use of a seed containing the higher percentage of fat, since a tincture, which is satisfactory in every respect, can not readily be obtained from it.

According to my experience, the seed should contain no less than 10, nor more than 15 per cent. of fats: if there be considerably less than 10 per cent. of fat, the activity of the tincture will be impaired, if there be more than 15 per cent. of fat, a clear and stable product can not readily be obtained.

To determine the influence of various menstrua on the seed, I prepared ten different tinctures, each 10 per cent. strong, by percolation after macerating for 12 hours. The seed used contained 20.45 per cent. of fatty matter.

The following table gives the menstrua employed together with the results obtained:

Menstruum Employed.	Color.	Appearance.	Nature of Residue.	Per cent. Residue.
1. Alcohol, 92 per cent.	Very pale yellow.	Very slightly turbid.	Yellow, oily.	1.72
2. Alcohol, 75 per cent.	Very pale yellow.	Slightly turbid.	Yellow, somewhat oily.	1.13
3. Alcohol, 50 per cent.	Pale yellow.	Turbid.	Yellow, varnish-like.	1.23
4. Alcohol, 25 per cent.	Pale yellow.	Very turbid.	Yellow-brown.	1.52
5. Alcohol, 92 per cent., with glacial acetic acid, 1 per cent.....	Pale yellow.	Very slightly turbid.	Yellow, oily.	1.40
6. Alcohol, 50 per cent., with glacial acetic acid, 1 per cent.....	Pale yellow.	Slightly turbid.	Yellow, varnish-like.	1.42
7. Alcohol, 50 per cent., with sulphuric acid, 1 per cent.	Pale yellow.	Turbid.	Yellow, varnish-like.	1.36
8. Alcohol, 50 per cent., with ammonia water, 1 per cent.....	Reddish-brown.	Very turbid.	Brown.	1.86
9. Alcohol, 50 per cent., with pot. carbonate, 1 per cent.	Pale reddish-brown.	Very turbid.	Brown.	1.85
10. Alcohol, 50 per cent., with pot. carbonate, 1 per cent., boiling, straining	Red-brown.	Very turbid.	Brown.	2.70

The following conclusions are to be drawn from these experiments: An alcoholic menstruum extracts a large percentage of the fatty matter, the addition of water to the menstruum will prevent this to a certain degree and will introduce a proportionate amount of extractive matter. The addition of acetic or sulphuric acids to the menstruum does not change the appearance of the product and does not materially increase the effectiveness of the tincture. Alkalis, like ammonia water and potassium carbonate give the tincture a reddish hue, due, undoubtedly, to the presence of a coloring matter, which turns reddish with alkalis and colorless with acids.

Tincture No. 10 was prepared in accordance with a formula, proposed some years ago, and reprinted in the Proceedings. While this method produces a tincture of a "strong" appearance and contains a large amount of extractive and coloring matter (see per cent. of residue), it can not be very active, since, the fats are saponified. Another danger lies in the fact, that boiling for some time is necessary, and since the alkaloids of the

Delphinine group are very susceptible to heat (Delphinine melts with decomposition at 119° C), it is very likely that the alkaloids in Larkspur are destroyed or removed in the process of manufacture.

Another method of preparing the tincture, used by some pharmacists, consists in removing the fats from the seeds by means of petroleum benzine and, then, they prepare the tincture from the fat-free seed. This method is, of course, to be condemned. Petroleum benzine removes not alone the fatty matter, but the alkaloids at the same time. The loss of alkaloids by this method can be prevented to a large extent by first moistening the seed with diluted sulphuric acid and, then, extracting with benzine. But I maintain, that the activity of Larkspur seed, in cases of pediculosis, is due to a large extent, if not solely, to the fats. Therefore, a fat-free seed should not be employed, nor should the fats be saponified. After clarifying tinctures No. 3, 4, 9 and 10, they represented preparations of good appearance. Tinctures prepared with 50, respect. Twenty-five per cent. Alcohol became turbid on standing, most likely due to the loss of Alcohol by evaporation. The same tinctures remained clear, when they were carefully protected from air.

Next, I concluded to use a seed containing a somewhat smaller amount of fats. A seed assaying 10.87 per cents. of fatty matter was employed. Of this, I prepared four tinctures, each 10 per cent. strong, by maceration for six days, shaking frequently.

The results were as follows:

TINCTURES PREPARED BY MACERATION.

Menstruum Employed.	Color.	Appearance.	Nature of Residue.	Per cent. Residue.
1. Alcohol, 92 per cent..	Pale straw yellow.	Clear.	Yellow, oily.	.97
2. Alcohol, 60 per cent..	Golden yellow.	Clear.	Yellow, somewhat oily.	1.23
3. Alcohol, 60 per cent. with ammonia water, 1 per cent.	Reddish-yellow.	Clear.	Yellow-brown.	1.38
4. Alcohol, 60 per cent. with glacial acetic acid, 1 per cent.	Pale yellow.	Slightly turbid.	Yellow-brown.	1.10

The process of maceration seemed to produce better results than percolation, the colors of the tinctures seemed deeper and brighter, in fact, tinctures No. 2 and 3 showed beautiful golden-yellow tints. Examination of the samples of seed used, after preparing tinctures for them, showed that menstruum No. 1 had extracted 83 per cent. of the fats present, No. 2 had extracted 52 per cent., No. 3 had extracted 63 per cent. and No. 4 had extracted only 27 per cent.

Efforts to assay the seed and the tinctures were not quite satisfactory. I found in the seed .64 per cent. of alkaloids, using a general method of

assay (weighing the alkaloids). Tincture No. 1 showed only .04 per cent. of alkaloids, No. 2 showed .03 per cent., No. 3 showed .057 per cent. and No. 4 showed .056 per cent. Nevertheless, it seems as if ammonia water as well as acetic acid helps considerable in the extraction of the alkaloids from the seeds.

These results, taken all in all, point to the use of an alcoholic menstruum, not weaker than 60 per cent., with the addition of a small amount of ammonia water to help in the extraction of alkaloids and to produce a somewhat darker color.

To my mind, Tincture of Larkspur Seed should be included in the next issue of the National Formulary, and I recommend to the Committee of Revision the consideration of the following formula:

Larkspur Seed, coarse powder,	10.00	Gm.
Ammonia Water,	1.00	Cc.
Alcohol, 92 per cent.	65.00	Cc.
Water,	35.00	Cc.

Macerate for six days, shaking frequently. Then filter and add enough alcohol to make 100 Cc. If necessary, the tincture may be clarified by means of purified talc.

A seed, containing no less than 10, nor more than 15 per cent. of fatty matter is preferably to be employed.

Columbia University, N. Y. College of Pharmacy.

LIQ. ANTISEPTICUS ALKALINUS RUBER.

BY J. LEON LASCOFF, N. Y. CITY.

Since the two different preparations of "Liq. Antisepticus" were introduced into the Pharmacopœia and National Formulary considerable confusion occurred between the physician and dispenser.

Quite frequently when Liq. Antisepticus Alkalinus, N. F., is prescribed, the U. S. P. preparation, which is amber color, is dispensed and *vice versa*.

The reason for giving the name "Alkalinus" is that the alkaline, saline solutions are based on the alkalinity and saline strength of normal blood serum.

The addition of menthol, eucalyptol, etc., are introduced to cleanse the mucous membrane.

The present Liq. Antisepticus, N. F., does not give satisfactory results, and it is rarely of uniform color. This can easily be shown by collecting samples from different sources, which will show a great variation of shade. To improve this condition it is advisable to use the powdered cudbear, 2.0 to 1000 Cc., instead of the tincture.

Liq. Antisepticus prepared according to the present N. F. turns cloudy after standing, while the improved is a permanently clear solution.

Another point which would be helpful is naming the N. F. preparation "Liq. Antisepticus Ruber," to distinguish the two antiseptic solutions.

I would suggest the following improved formula:

Sodium bicarbonate	30.0 Gm.
Sodium biborate	30.0 Gm.
Sodium salicylate	12.0 Gm.
Sodium benzoate	4.0 Gm.
Thymol	0.3 Gm.
Menthol	1.2 Gm.
Eucalyptol	0.4 Cc.
Oil gaultheria	0.3 Cc.
Glycerin	333.0 Cc.
Alcohol	40.0 Cc.
Cudbear	2.0 Gm.
Pur. talc. (U. S. P.)	10.0 Gm.
Distilled water, sufficient to make	1000.0 Cc.

Dissolve salts in water, oil wintergreen and menthol, thymol, eucalyptol in alcohol, macerate with the powder cudbear for 24 hours and filter.

THE PRODUCTION OF BUTTERMILK FROM SWEET MILK BY MEANS OF LACTIC ACID BACTERIA.

BY F. W. NITARDY.

Buttermilk has of late become a favorite drink and is now served at most soda fountains. By many a buttermilk produced artifically from sweet milk is preferred to the old fashioned product, this also has the advantage of better keeping quality.

The flavor of buttermilk is due to lactic acid fermentation, which naturally takes place in cream and milk when they sour. By introducing lactic acid bacteria into sweet milk and allowing same to stand at proper temperature for some time a product having the familiar "buttermilk" odor and taste is the result. It differs, however, in that all butterfat is present in this product, while in ordinary buttermilk most of it has been removed.

Sweet milk alone produces a product that is too rich in butterfat, it is best to use diluted sweet milk, or a mixture of skimmed milk and sweet milk, both of which should be fresh. Skimmed milk alone can be used, but some butterfat is desirable.

The temperature at which the milk is kept while fermenting has considerable influence over the quality of the product obtained. If kept too warm, the milk will separate and form curds which will not readily break up on shaking. If kept too cool, fermentation is too slow and the proper flavor is not produced.

I have found a temperature of 26°-27° C. (78°–80° F.) the most suitable. Enough bacteria should be added to bring fermentation to the desired point in 24 to 30 hours. If it has to stand longer it does not remain as smooth.

Manufacturing houses have put on the market tablets of lactic acid bacteria, to be used for making buttermilk, but I find it more satisfactory, also considerably cheaper, to grow a culture and keep it in liquid form. I used a few tablets for a starting-point, and have grown the culture ever since.

To produce the culture I use:

Simple syrup	250 Mils. (Cc.)
Salt	1 Gm.
Water	3750 Mils. (Cc.)

Mix and warm to 26° C., and add lactone tablets, crushed, No. 4.

Or

Old culture	50 Mils. (Cc.)

Allow to stand in a bottle stoppered with a plug of absorbent cotton in a place where the temperature will be maintained between 26° and 32° C. (80°–90° F.) for two to three weeks, or until the mixture has become quite opaque, acid in reaction to litmus paper, and of seemingly syrupy consistence when poured. Then place on ice.

To produce buttermilk I use:

Sweet milk	5000 Mils. (Cc.)
Water	3000 Mils. (Cc.)
Salt	5 Gm.
Culture	50 Mils. (Cc.)

Or

Sweet milk	3000 Mils. (Cc.)
Skimmed milk, fresh	5000 Mils. (Cc.)
Salt	5 Gm.
Culture	50 Mils. (Cc)

Mix the milk and water (or skimmed milk), strain, and heat on a water-bath to 26° C. (80° F.), dissolve the salt in this mixture and add the culture, mix well and transfer to half-gallon bottles, filling same about four-fifths full, stopper with absorbent cotton, pack the bottles into a box of sawdust and allow them to stand from 24 to 30 hours. Remove a bottle, shake and taste; if sour enough place all on ice; if not allow them to stand for five or six hours longer and then place on ice. Shake well before serving.

The buttermilk made from a mixture of milk and skimmed milk is thicker and somewhat smoother than that made from milk diluted with water.

Buttermilk produced in this manner will keep from one to two weeks and longer if kept on ice. If the ice-box is not cold enough to check fermentation, it will slowly continue to become sourer, until it finally becomes unfit to drink.

BEEF, WINE AND IRON.

BY L. E. SAYRE.

This National Formulary preparation, recognized under the title Vinum Carnis et Ferri, is well known as a solution of extract of beef in water, alcohol, sherry wine and syrup, flavored with compound spirit of orange, each dessertspoonful representing 0.264 Gm. extract of beef and 0.236 Cc. of tincture citro-chloride of iron.

The medical profession in prescribing this preparation seems warranted in the assumption that, as it has an official standing, it is of practically uniform composition. Whenever and wherever dispensed it should therefore represent practically the same proportion and the same percentage of extract of beef, of iron and of alcohol. The Food and Drugs Law also recognizing this preparation as official, would naturally expect it to be of uniform composition—containing the percentage of ingredients named. This latter is more of a serious question from the point of view of the dispenser, as he is apt to be called to account for even slight variation from a recognized standard. Drug analysts and drug inspectors, performing their duties, have little or nothing to say in this "calling to account" of those who send into the laboratory preparations not in full conformity with prescribed formulæ.

But we have in this preparation as officially formulated inherent elements of variability, and it would seem that it might be classed as one that should, or might, vary within certain wide limits, as no two operators would produce pharmaceutically exactly similar preparations. This will appear if we examine carefully the official (N. F.) formula, referring in detail to some of the essential ingredients.

Sherry Wine.—There seems to be no standard for this. A standard for Vinum album (U. S. P. and N. F. appendix) is obtainable, but in neither case (the U. S. P. or N. F.) is it mentioned that this article is related to sherry wine. It leaves a chance, at least, for employing a so-called sherry wine of extremely variable quality and of variable alcoholic strength: that this is the case, that this chance is taken, is confirmed by our examination of some of the market preparations of beef, wine and iron.

Quantity of Sherry Wine.—Assuming that we have a standard for sherry wine, the quantity of this wine employed in the N. F. formula is necessarily slightly variable. No two operators may produce the same quality of preparation, and still may follow conscientiously the formula, because the N. F. directs, in the first part of the operation, that alcohol be distilled off, *and to the residue* sherry wine be added sufficient to make 1000 Cc. Now the quantity of wine added will vary in proportion to the concentration of the residue which remains from the distillation. Some operators may reduce this residue more than others. This it may be said is a variation practically negligible, but it nevertheless shows that the preparation cannot be supposed to be as uniform in composition as most of the official preparations are supposed to be.

Extract of Beef.—Much has been said of the slight nutritive value of extract of beef, but, however little nutriment it may possess, the quality and quantity of this ingredient should not be slighted, yet we meet with, on the market, extreme variations in it as will be seen in this subjoined report. Still extract of beef has grown to represent several widely different preparations. Leibig's extract of meat (often employed as extract of beef) may be obtained from mutton. Extracts of beef may be more or less salty, have different percentages of peptone, of water, etc. It may have been concentrated in vacuo, in open pans, etc., etc., so that we may not expect absolute uniformity in this preparation.

The Food and Drugs Law holds preparations to their *professed standard* It is plain that the professed standard of this preparation is variable, and one of two things is desirable, either the officials executing the law must accept a variable preparation, or the Formulary must produce one less likely to vary.

That the market is supplying this article widely variable has been very ably shown by J. P. Street (Amer. Jour. Pharm., August, 1907, p. 355), and by our own examination of the preparations found on the markets in Kansas. Merely for the purpose of investigating this phase (variability) of the preparation, we have examined twenty-five different "brands" of beef, wine and iron sent into the laboratory by inspectors from the Kansas market. It is not necessary to give details of analysis, but it may be said in passing in estimating the percentage of protein the nitrogen content was not taken as was done by Mr. Street, but an approximate estimation was made of protein by precipitation, and measuring the bulk of the precipitate—this being considered sufficient for comparative purposes. The following items were noted in the examination:

1, price; 2, percentage of alcohol declared on label; 3, percentage of alcohol found; 4, total solids; 5, inorganic solids; 6, percentage of iron (Fe_2O_3); 7, color; 8, sediment; 9, proteid (?) precipitated by means of bromine solution. A chart showing the various degrees of divergence from standard (?) may be published some time in the future in the "Bulletin" of the Kansas Board of Health, but for the present paper it is deemed best to show only the extremes of variation.

Taking these various items in the order named, we have found in these twenty-five preparations the following variations:

1. Price: From 50 to 75 cents per pint (retail); from 25 to 42 cents per pint (wholesale). In a few cases the price was not reported.

2. Percentage of alcohol declared: From 12 to 25 per cent.

3. Percentage of alcohol found: From 12 to 22 per cent. In all but two cases the percentage declared was greater than that found. In one case, however, the declared percentage was 12 per cent., and the percentage found was 20.5 per cent. In another case the percentage declared was 25 per cent., and that found was 16.8 per cent.

4. Total solids: Variation, from 4.691 Gm. to 25.653 Gm. in 100 Cc. This immense variation was due to sugar content.

5. Inorganic solids: Variation from .403 to 1.563 in 100 Cc.

6. Iron (Fe_2O_3): Variation from .012 to .472 in 100 Cc.

7. Color (estimated in 100-Cc. burette): Variation from light orange-red to very dark reddish-brown.

8. Sediment (deposited in a 100-Cc. tube): Variation (by measure) from a mere trace to 6.5 Cc.

9. Proteids (?) precipitated by bromine in a graduated 100-Cc. tube: Variation (by measure) from 5 Cc. to 30 Cc.

It is needless to say that such variability is unwarranted; still, when we consider that this preparation has scarcely emerged from the class of unofficial proprietary articles, it is not to be wondered at. Great liberties will likely be taken with it unless some one is here and there called to account for not adhering to the N. F. formula.

We would not say that the responsibility lies very much upon the formula itself, as Mr. Street has said. But so long as we have in the formula ingredients having no standard, the preparation is sure to vary within certain limits, which should be allowed by the food and drug officials. What these limits may be the future will determine. The question of standards for such preparations is doubtless receiving attention at the hands of the N. F. Revision Committee, and in such work of standardization there is enough to keep an army of pharmaceutical chemists busy.

University of Kansas.

SUPPOSITORY BASE.

BY H. A. B. DUNNING.

While cocoa butter is without doubt a very satisfactory suppository base, generally speaking, in several particulars it is lacking, particularly when used in southern latitudes. Suppositories prepared with cocoa butter as the base, will not stand exposure to the summer heat. On very hot days they are apt to be in bad condition on receipt by customers even when sent directly from the iced moulds, depending of course on the distance sent, or rather upon the time exposed.

Again cocoa butter proves unsatisfactory when combined with a large percentage of solid extracts, 5 grain to the 30-grain suppository. Particularly is this true of extract of witch hazel; the fault here is apparently because of the fact that when liquefied the fluidity of cocoa butter is great, it lacks viscosity, and unless kept very near the congealing point, a more or less difficult proposition, the extracts will separate from the butter either in fine particles or sometimes as a mass. In some cases this will occur even when the cocoa butter is sufficiently cool to be creamy.

Of course in searching for a substitute to be used when it is desired to

combat the difficulties mentioned, it must be borne in mind that the substance must melt around 98° Fahr.

Several years back I recommended in a collection of notes read, I think before the Practical Pharmacy Section, the use of cocoa butter containing 15 per cent. castor oil, 10 per cent. white wax, as a substitute for cocoa butter for summer use.

Having a complaint about some adrenalin suppositories prepared with this base, this led to the following investigation:

Although the mode of testing is doubtless very crude, I think the comparative results are fairly satisfactory and somewhat instructive. The chief test was carried out by holding suppositories of cocoa butter and cocoa butter in various combinations in the hand and noting the effect while being timed.

In several cases the capacity for heat was observed in the following crude but comparatively accurate manner, a definite weight of paraffin was kept liquid on a sand bath; in the paraffin was suspended a definite quantity of water in a beaker, which was kept at a constant temperature. In testing the suppository by this method it was floated in the heated water and the time required for it to melt was noted.

EXPERIMENTS.

Cocoa butter suppository, m. p. 33° C. about, when held in hand is softened in 3 minutes and melts in 6, runs freely and spreads rapidly over a large surface. When tested by warm water method requires 3 minutes to liquefy.

Cocoa butter with 10 per cent. castor oil, m. p. 32° C. about, held in hand is softened in about 3 minutes, melts in 5, runs freely and spreads rapidly, is less liquid than plain cocoa butter. With warm-water method melts in 2 minutes and 40 seconds.

Cocoa butter with 15 per cent. castor oil, 10 per cent. white wax, held in hand softens in 10 minutes, becomes creamy in 20 minutes, does not run or spread well, but has a tendency to hold its shape.

Cocoa butter with 15 per cent. castor oil, white wax 5 per cent., m. p. 36° C. about, held in hand softens in about 10 minutes, becomes creamy in 17 minutes, and otherwise acts very much as the preceding one.

Cocoa butter with castor oil 10 per cent., white wax 2½ per cent., m. p. 34° C. about, held in hand softens in 11 minutes, melts in 16 minutes, runs freely and spreads nicely. With warm water liquefies in 4¾ minutes.

Cocoa butter with castor oil 15 per cent., white wax 2½ per cent., characteristics very similar to preceding one, softens in 8 minutes, melts in 11, runs more freely than one preceding.

These experiments led me to suggest that for use in summer time, and when a large percentage of solid extracts are dispensed, a base composed of cocoa butter containing castor oil 10 per cent., white wax 2½ per cent.,

is more satisfactory than cocoa butter. This mixture melts at body temperature and spreads quite freely.

The examination of some suppositories in the following combinations, cocoa butter, adrenalin, water; cocoa butter, diluted hydrochloric acid, water; cocoa butter, adrenalin, dilute hydrochloric acid and water, seems to show that the addition of $\frac{1}{24}$ grain adrenalin to 30. grain suppository increases the resistance of cocoa butter to heat, and prevents the suppository melting freely at body temperature.

JOURNALISTIC PHARMACY.

A Letter to a Young Pharmacist from His Former Employer.

HOPEFULTOWN, *August 16th, 1909.*

MY DEAR MICHAEL:—

Along life's pathway I have borne an average man's burden for more than fifty years and I would declare the journey, indeed, worth while, if one could be assured that he has lessened the burdens of coming generations even a straw's weight, or might be certain that he had removed even a very small pebble from out the pathway his successors must tread. It is the inspiration that such possibilities offer that leads me to write you touching a matter which, in our long intercourse, we have not, heretofore discussed. You will admit, I know, that I have given you whatever advantage might accrue from a recital of my experiences that would apply to your daily routine, and I should be happy to know that your road to success has been even slightly less difficult to travel, in consequence.

It is most unfortunate, in my opinion, that when one's careful observations and well-selected experiences lead him to disapprove current practices, and to adversely criticise prevailing customs, modern, so-called picturesque language should style him a "knocker" and call the means he employs a "hammer." Had such terms been in use during my earlier life I suppose our old country schoolmaster, who so vigorously thumped our knuckles, would have been known as a veritable "knocker," and his trusty ruler a ready "hammer;" his much-used blue pencil, which so painfully banged our pride and ambitions, would now be described as a "sledge hammer." And yet, I believe it was this "knocking" and "hammering" that frightened me into doing something, and I can truly say of the four gentlemen whom I served as employee, that the only one who could and did teach me anything was one whom, I am sure you would pronounce "a merry little knocker with his hammer always out." I, therefore, conclude that we may safely ignore such imputations, and regard them as poor substitutes for squeals from the wearer of the shoe that pinches.

This is all a prelude to a cantation upon a subject that I believe has much bearing upon "Practical Pharmacy and Dispensing;" something that greatly hinders healthful progress along these lines. It is to warn you

and, through you, other young pharmacists, against being led into error or against being harmfully influenced by pharmaceutical journals, that I write. Painful it is, to realize that much of the good these do is neutralized by the errors they promulgate and by the bad examples they exhibit. I am more strongly influenced to give this warning because, for many years of my active manhood life, I was so unfortunate as to accept journals as exemplars and whatever they contained as gospel. I should be glad to be convinced that I was singular in that regard, but I fear I was not, and that my credulity was the confidence of many. Faith in the works of type, I believe to be inherent, at least instilled, because in the beginning of their use and in the beginning of our lives they were chiefly employed in the dissemination of truths; through "good books," therefore, it is most natural for us to believe whatever we see in print, and I fear this faith is held to a greatly unwarranted extent by young and inexperienced pharmacists of to-day.

I would not have you believe me unappreciative of the worth of the pharmaceutical press or that I underestimate the power it wields; I hope I am justly sensible to these. Both its abilities and influence will rapidly increase, and I would have it to most carefully and fairly meet its responsibilities. While we may not allow ourselves to adversely criticise such publications as are private property or individual enterprises, since we are not responsible for the acts of these, I do believe that we ourselves are, to a degree, responsible for the character and contents of these journals that belong to the physicians and pharmacists of the nation, and that all who are interested in medicine are entirely justified in their efforts to improve them and add to their usefulness, by calling attention to their faults. The three journals, national in scope, that may be subject to the control of the professions of medicine and pharmacy should be assembled and compared with each other, when it may be decided whether or not they reasonably fill the missions assigned them, in relation to pharmacy, and in what respect each particular one falls short.

You, through your teachings, study and observations, are constrained to have your shop and stock conform to well-established rules of art. *You* avoid bad color-effects and strive to maintain an orderly and cleanly establishment. Your side lines, if side lines you must have, do not largely preponderate and are not always the most conspicuous parts of your window displays. Surely they are not suddenly mixed up with your more important and more serious stock of drugs and medicines. *You* are required to use good taste and care in the selection of your stock and the character of your side lines must be consistent with your general business, both in form and quality.

You and *I*, of all men, must be careful and accurate in every detail touching substance, container, label and wrappings. Especially is it important that you do not let error of any kind slip into the compounds you

dispense, more particularly those of your own manufacture. The articles not of your own make must be properly placed and cared for; they must not be disposed of when out of date nor must one manufacturer's make be sold under another's label, and if they are really bad, you refuse to sell them or caution your customer in regard to them. According to law, even proprietary articles that contain harmful ingredients must bear the contents on the label, which must not be false or misleading.

If all these things are required of *you* or *me*, in the name of all that is fair and just, why should they not be required of these journalistic pharmacists who are both exemplars and teachers. I would have you read and re-read the requirements you must meet, just made, and note how closely they may be made to apply to our journalistic contemporaries. Notice their lines, their curves, their colorings, and decide whether or not they conform to proper requirements of proportion, appropriateness and harmony. Note also the character of their stock and its make-up, especially its grammar, construction and, markedly, its "over-capitalization." You will find it badly "watered" in some instances. One of the journals under consideration sets a splendid example in this regard, which might be followed greatly to the artistic advantage, at least, of the other two. Sometimes, when I am reading of our old friends, magnesium sulphate and tincture of opium, I am led to bow my head as to a deity or to some exalted potentate; so strongly set forth is their personality in big letters. The extravagant use of capitals in our pharmacopœia, and in the National Formulary, may, in a measure, lend excuse for this unsightly practice.

The most of us poor *substantial* pharmacists have great trouble with our Latin, as we attempt to use it in making copies of prescriptions, greatly to our discredit and disadvantage when dealing with cultured physicians and laymen, but these "paper" pharmacists seem to have much more trouble than do most of the members of our class, even though the journalists have set us such poor examples. I am sure they are responsible for much of the unsightly prescription form that is positively shocking, and they cannot hide behind the bad forms occasionally given as examples, especially in board examinations: evidencing, as they do, one of the most detracting deficiencies in pharmaceutical practice. It seems almost impossible to believe that the following should appear in a pharmaceutical association's journal.

℞. Sodii bicarbonas.
Hydrargri. chlor. mite āā gr. j.
M. ft. pulv. No. ij.

The chief side line (advertising) of these journalistic pharmacists is often badly selected, sometimes most inartistically displayed. This is not so bad as it is to have this less important matter interrupt you when you are seriously studying something that is apparently important. *You* keep

cachous and sugar-coated licorice lozenges, but you do not, I am sure, mix the former with strychnine granules or the latter with asafetida pills.

Application of your rules of conduct, in reference to your business, may be made to the examples that will follow. They were secured by scanning a few copies of the journals in question, without effort to find very bad ones.

Would you not destroy all your Seidlitz powder envelopes if the directions read, drink during "effervesence"? And would you not consider one of your clerks unpardonably careless should he send out a jar labeled "Anhydrous *Woodfat*," or bottles labeled: "Ammon*n*ium Chloride," "*Flext Senna*," "Recified Oil of Turpentine," "Potasstium Bromide," "Asafoedita," "Rochelle Salt*s*"? Why write of "Spirits of Nitre" when ghosts are not at all in question? "Red Mercuric Iodide"; red iodide of mercury for ancient gentlemen, like myself, may be excused, but "red" and "mercur*ic*" and "iodide" on the same label would be slightly superfluous. To write of the "Rescification of linseed oil" without describing the process or effects is really unkind. Of course, they will call these typographical errors and bad proofreading; we call the same, very ignorant or careless label-writing and unpardonable checking.

You remember my three excuses for abbreviations; in order of merit they are: want of space, want of time, and an indifferent knowledge of orthography. These journalistic pharmacists must be very, very busy, for they have ample space and surely they are not bad spellers. Nothing in writing, in my opinion, is more inartistic than is unwarranted abbreviation; next to this, Arabic figures detract from the beauty of printed page or written sheet. Small omissions are not as unsightly as abbreviations and figures, but they are less pardonable.

It is in the publication of prescriptions and formulas that many of these "external faults," as we call them, occur. "Oil peppermint," "oil anise" and "oil tar" read exactly like oil-cloth, oil cake and oil well. Is the term "oil" not used descriptively in each case? "Tincture grass"; is that anything like blue, green or saw grass? When we hear the injunction "Oil Caraway" read, we are tempted, while reminded of Carry Nation, to facetiously ask, "Why, alas, should poor Carry be oiled?" If these journalistic pharmacists must omit the preposition, let them conform to the English idiom and use the descriptive term first; peppermint oil, anise oil, tar oil and the like are not bad. The application of this rule would improve "Magma Magnesia," which I find used in the same article with "Magma of Magnesia." The same rule would not allow the printing of a title that does not exist: "Syrup of iodide of iron, U. S. P."

Examples of porcine Latin will appear in the copies of prescriptions that will follow. In addition to these, I notice, in reading the genitive form of salicylicum, in two instances, given as "salicyli" and as a protest to Latinized plurals for Anglicized words we find the clause, "is always to

be preferred in acid mediums," which is bound to remind us of sour old spiritualists. In one prescription, beginning with the sign for the Latin verb *recipe*, "bismuth. subnitr*as*" and "bismuth. subgall*as*" are directed to be mixed with "magnesii ustum." You will, no doubt, wonder why the adjective does not agree with the noun and if the physician really intended that the metal and not the carbonate should be burnt.

I sincerely hope that while you are trying to interest physicians in official products, you will not get up a "Cold and LaGrippe Remedy," a "Spring Tonic," "for that tired feeling," or "A Good Liniment," from formulas published in any of these journals. It will be better for you to study the propaganda matter that you may find on the opposite page. And, while Dr. Wiley is still abroad in the land, preaching the gospel of genuine and pure fruit flavors, it will be unwise for you to offer "Artificial Fruit Flavors," formulas for which you may also find published in some one of these journalistic apothecary shops. The sale, or use at your soda fountain of these artificial flavors, will not help your business. Your customers will awake in the morning after having imbibed them, the night before, with the impression that some surgeon has been after their already removed appendices. If we can not honestly use these things, why should *our* journalists publish the formulas. It is bad stock, the kind *we* must not handle.

Be careful in following the processes given; these journalists are getting into deep water when they undertake to teach their readers the intricate details of laboratory pharmacy. I would have you and other young friends avoid these pitfalls; they are even more dangerous than a course in a correspondence school. Able and experienced professors at our colleges are not altogether satisfied with what they can do, using their explicit textbooks and well-equipped laboratories. Percolation, the making of granular effervescent salts and the preparations of complicated elixirs are "very simple" and "easy" processes, but only in the minds of journalistic pharmacists.

Journalistic pharmacy will tell you many very queer things and, at times, is dangerously superficial, for instance, it says, in a mixture of zinc chloride, mercuric chloride and "lime water" without any reference to the quantities used, that if you will mix the zinc salt with the solution of lime, first, you will get a white precipitate only, that is quite so, but only so if the proportions are such as to cause all the calcium hydroxide to be precipitated. It tells you that the hypophosphorous acid added to the syrup of ferrous iodide, United States Pharmacopœia process, causes a "disappearance of color" when it is a positive fact that if properly applied, it intensifies the green color. It recommends that double the amount of acacia should be used in the official emulsions of cod-liver oil when recognized authorities deem the quantity exactly right; it is the water, used in the primary emulsion that may be reduced with advantage. One and one half

grams of cacao butter is stated as the proper quantity for a urethral suppository, when one gram is quite enough. It tells you, in connection with the making of tincture of iodine, without qualification as to solvent or quantity, that potassium iodide "is only slowly soluble, three days being required for so'ution at a temperature of 77 degrees F." "By placing the *finished* product in a window and allowing the sunlight to act upon it" is the choice way journalistic pharmacy directs the *unfinished* product to be subjected to sunlight. It is not believed that the window *per se* plays a very important part in the process. It is slow, very slow, this journalistic pharmacy, even yet, it has not learned that the solid deposit that is sometimes thrown down from the elixirs containing terpin hydrate, National Formulary, is sugar and not terpin hydrate. That sugar is only sparingly soluble in alcohol or in glycerin, seems to have been continuously overlooked.

Consistency is not always a leading principle in journalistic pharmacy. It inveighs against the use of tincture of asafetida in making an emulsion of that drug, which is no doubt, good advice and immediately afterwards, advises the purification of asafetida by dissolving it in alcohol and evaporating the resulting tincture. In one moment, it tells you that spirit of nitrous ether should be freshly or frequently prepared and in the next advises you to make up enough to last four months. It gives you, in tedious detail, the modes of dissolving protargol, but pays no attention to the protection of the solution against the effects of light. These journalists, some of them, rail unmercifully against proprietaries and then publish to physicians a ready-made prescription in which "Norwood's tincture of veratrum" appears: probably the writer and editor regard it a cousin to Fleming's tincture of aconite or Churchill's tincture of iodine. It, rather gratuitously, instructs us, that "The ichthyol is best weighed off on a piece of paper which has been formed into a cup-shaped receptacle and from which it is readily removed with a spatula," but makes no mention of the necessity of testing the insolubility of the salol coating of the pills.

Let me close this rather lengthy letter by producing some of the prescriptions that may be found in these journals. Purposely, I will give them *verbatim et literatim* and trust you will not fail to notice the impossible mixtures of Latin, English, odd case-endings, omissions and inconsistent abbreviations. The language used, in a number of instances, to describe procedure, is the most remarkable I have ever read. The pharmacy, too, in many cases, is very bad; some of it is positively hurtful. These are the examples:

Liquor iodi compositus ..... ℥iss
Glycerite of yolk of egg ..... ℥i
Aqua aurantii flores ..... ℥i
Syrupus tolu ..... ad ℥iv
M.

Note capitals, endings and fearless use of English. Now consider this one :

"Ol. savin
Ol. rutæ.
Ferri reduct.
M. F. No. 30. Use wax."

Very fine, very fine ! Period used when ending is complete, no quantities, nothing to indicate what is to be made ! "Use wax," for what?

"Ol. menthæ..... gtt. x
Sol. acid. boric..... fl. ozs. 2"

"Use as a gargle. The physician does not mean to filter; otherwise he would not prescribe 10 drops. The best way is to strain through cotton."

Very funny, very funny ! Mental telegraphy between physician and author, "otherwise," how did he know it? That "fl. ozs. 2" looks fine under that "gtt. x." "Use wax."

"Thymol..... 2.0
Sod. borat..... 3.0
Aquae q. s. 60.0
M."

"By rubbing in a mortar the thymol and dissolving it with water and borax we will get one mass which will float to the surface, but by dissolving the thymol in a small quantity of alcohol and borax in water mixing well we will get a uniform cloudy mixture which easily could be used for the purpose prescribed."

I am sure you will agree with me that this is choice, a style our youths should *not* imitate. You will also value the knowledge that the uniform cloudy mixture will remain so an instant only and the next day there will be one more "mass which will float to the surface." As we are not told for what purpose the mixture is prescribed, we would scarcely be safe in advising the use of two grains powdered tragacanth or the use of fifteen minims of alcohol and five grains of powdered soap; either of which will effectively suspend the thymol.

"℞ Sodii chloridi ..... gr. vii
Beta eucain ..... gr. v
Camphor ..... gr. iss
Chloral hydratis ..... gr. ii
Aqua distillatæ ..... ℥ ii
M. S. A."

"Proceed as follows: Dissolve all the ingredients, except camphor, in water in the two-ounce bottle; place the camphor in a small mortar, add

two or three drops of alcohol, triturate until the camphor is dissolved and then gradually add the aqueous solution, stirring constantly. The camphor will dissolve completely.

"Then filter the entire solution back into the two-ounce bottle, through cotton which has first been moistened with distilled water, and the result will be a clear, colorless and perfect solution."

Whew! Is it not mighty, Michael?

"Sodii salicylatis ..... ℥xii
Fluidextract colchicum seed ..... ℥i
Fluidextract jaborandi ..... ℥i
Elixir taraxici comp. .....q. s. ad ℥xvi
Allow to stand 7 days, and filter."

"℞ Pancreatin ..... gr. xl
Colalin ..... gr. iv
Ichthyol ..... ℥i
M. ft. pil. No. xx, salol-coated.

"The mass is readily prepared by mixing the ingredients, adding 15 grains of finely-scraped yellow wax, 10 grains of starch (or powdered extract of licorice) and then enough powdered licorice root to make a very firm mass.

"The coating process is very simple, but the details must be nicely and carefully attended to."

"THE SALOL-COATING PROCESS."

"Use about 15 grains of salol and 2 grains of tolu balsam, the latter being used to prevent the coating from cracking. Melt the salol and the tolu in a small capsule or evaporating dish, using only just enough heat to melt them, and as they melt at about 110° F. (47° C.) very little warming is necessary.

"Now place the twenty pills in this capsule and rotate them in the fluid until all the salol is taken up and the capsule is cold.

"This will occupy but little time, makes a nice coating, and the pills are preferably dispensed in a box with a little cotton.

"The object of the salol-coating is to prevent the pills from dissolving in the stomach, as their action therapeutically is in the intestines."

That is true, the object of the salol-coating is to prevent the disintegration and absorption of the pills in the stomach. Three-fourths of a grain of salol will be compelled to stretch itself wonderfully to sufficiently protect so large a pill. I am quite sure our advisor did not try one of his pills as to its solubility in water, and most certainly not in a solution simulating the gastric juice at body temperature and with agitation. It would require at least three grains of salol to effectively coat these pills, and it

would be impossible to coat them by the process given. This is too bad; such as this does pharmacy great harm. The testing of enteric pills is quite interesting. I have repeatedly taken pills of calcium sulphide, variously coated, that I might test their power to resist the digestive processes of the stomach, and I knew a young physician to swallow salol-coated pills with silken cords attached with which to withdraw them, and this he did at intervals until the pills might have passed into the intestines.

"℞ Quinine sulphatis ..... ℥i
Potass. acetatis ..... ℥i
Syrupus aurantii ..... ℥ii
Aqua menthæ pip. ..... ℥iv
Ac. sulph. arom. q. s.
M."

The pharmacy of the remarks upon this prescription, was worth while. The prescription was declared an impossible one and no remedy, such as the use of an equivalent amount of quinine acetate and the non-use of acid, was offered.

"℞ Sodii nitritis ..... ℥i
Ess pepsin, Fairchilds ..... ℥iv
M.

"The effervescence is caused by the formation of gases through the action of the acids in the essence on the nitrite, which is alkaline, but whether this would change the therapeutic action is problematical."

Sodium nitrite has lately come into much use, and many unfortunate combinations are made with it by physicians. It is best administered alone in distilled water. Our friend would have soon discovered that the "gases formed" were not carbon dioxide, as intimated, had he tried the prescription, and would have been sure that the therapeutic effects had been changed.

"℞ Terebeni.
Ol. eucalypti.
Ol. gaultheriæ ..... āā ℥i
Ft. emulsion ..... q. s. ad. ℥iv
Sig. One teaspoonful.

"The rule is to employ one-half as much gum as oil, weight for measure, and one and a half times as much water as gum. This makes the proportion thus: gum 1, water 1½, oil 2."

All oils look alike to this journalistic apothecary. He evidently makes emulsions of fixed and volatile oils by the same rule without any regard to the extent of dilution.

"R Codeinæ ..... gr. iv
Terpin hydratis ..... ℥ss
Potasii iodidi ..... ℥iv
Elixir aromatici ad ..... ℥iv
M."

It is advised for this prescription that the terpin hydrate be finely powdered and suspended with acacia, which is not bad. This is a prescription offering fine opportunity to extemporize a special aromatic elixir, in which the terpin hydrate may be dissolved during the process. It might be necessary to use a slightly increased amount of alcohol and but little glycerin.

"R Strychninæ sulphatis 0.008
Ammonii carbonatis 1.60
Spiriti frumenti 150.0
Fiat solutio.

"R Strontii bromidi 6.0
Sodii bicarbonatis 40.0
Carbonis ligni 20.0
Bismuthi subcarbonatis 20.0
Lactis magnesiæ 200.0
Fiat mistura.

These prescriptions appear, as you see, properly written, but without comment as to their pharmacy, which would seem necessary. Fortunately, the alcohol of the whiskey in the first overcomes the difficulty in that one, and the precipitated strontium carbonate in the second is hidden in the other insoluble substances of the second. I notice that very little thought is given to the chemistry of strontium by physicians; they seem to think its combinations are much like those of the alkalies.

I fear if you allow this letter to be published it will get me into a world of trouble; all my many faults, deficiencies and mistakes will they summon against me and I shall be overwhelmed, but how inconsiderable is the peace and comfort of an individual when compared to the possibility of improving the influence of even one great pharmaceutical journal.

Wishing you a long life of uplifting usefulness and admonishing you to continue steadfast in your devotion to pharmacy and to truth, I am,

Faithfully yours, HENRY P. HYNSON.

TWO SUGGESTED ADDITIONS TO THE NATIONAL FORMULARY.

BY HUGH CRAIG, NEW YORK.

At the instance of Mr. Raubenheimer, associate of this Section, I made some experiments with mixtures of extract of malt and cod-liver oil. As a starting point, I took the formula of the British Pharmaceutical Codex; and, except in regard to the added flavor, the formula does not differ materially and I found it to be most satisfactory.

I suggest the following:

EXTRACTUM MALTI CUM OLEO MORRHUÆ.

Powdered chocolate	20 Gm.
Hot water	10 Cc.
Cod-liver oil	100 Gm.
Extract of malt	870 Gm.

Make a paste of the chocolate with the hot water, and allow it to cool. Add the extract of malt gradually, triturating constantly; then add the oil in divided portions, triturating well after each addition.

The following formula for an anodyne liniment is one which I have known to be prescribed with excellent results. It does not simulate any proprietary preparation:

LINIMENTUM CAJUPUTI ET CHLOROFORMI COMPOSITUM.

Oil of cajuput	60 Cc.
Chloroform	60 Cc.
Methyl salicylate	120 Cc.
Soap liniment, enough to make	1000 Cc.

Mix in the order named.

AN IDEAL IN PHARMACY.

BY H. A. PEAIRS.

Knowing that this is the Section of "Practical Pharmacy and Dispensing" and that the idealist and theorist is not generally supposed to be in place in such a meeting, I yet present this paper, believing that the reiteration of the ideal finally produces the practical and that nothing of importance is ever accomplished without a plan approaching the ideal is first outlined in the minds of those who execute it.

As your ideals are, so will your position in the community be. The world is a good judge in the long run, and your measure is usually pretty fairly taken by the public.

Every man has an ideal plan for business whatever may be his line of work. Many cannot tell what the plan is but if it be outlined they will recognize it. It may not be practical but it is nevertheless a plan. Environment may modify it—may even overthrow it.

Ideals in business must change as conditions change, yet there are some underlying principles in the profession and practice of Pharmacy which will not change as long as the world lasts. The truth must be told and knowledge gained by investigation, and experience must be shared by pharmacists if there is to be an ideal profession of Pharmacy.

What are the ideals of pharmacists? What are your ideals? What are your competitor's ideals? Does the business of pharmacy, as now conducted, present any number of high ideals to either the public or its mem-

bers? Is there anything about the drug business that is ideal? Does it present to you any ideal reason for being in it? Does your business or your store represent your ideals?

You can perhaps answer these questions better than I, or it may be that seeing as others see us will better enable us to answer them.

The public in general believes the drug business to be most desirable—first, because they believe it to be very profitable; second, because it is genteel or clean; third, because it gives professional standing as no other business does. Are these things true, or is the public mistaken?

To the first you will answer that the drug business is not profitable, but between the prices paid by the public and the cost of manufacture there is a large profit. Where does it go? To the second you will agree that, when comparing the business of pharmacy with other commercial lines, it is clean and respectable. To the third you must agree that if we do not have professional standing it is our own fault.

Pharmacy, to exist as a profession, must be profitable, and this profit must be obtained from the public—our customers. If we are to have their confidence we must stand in the community for knowledge, care and honesty, for in no other business will ignorance, carelessness and dishonesty produce more direful results than in that of pharmacy. You hold the life of the community in your hands.

Ideal communities, however, cannot be developed on the surface. They are not the growth of a day, nor of weeks, nor of a lifetime, but are developed through proper training, education, and experience passed on from generation to generation.

Nothing has ever been accomplished toward the elevation of pharmacy and the business of pharmacy which has not depended upon high ideals professionally and commercially. If we look at the drug business from its development, we can determine some of those ideals. If we read the "Objects of the American Pharmaceutical Association" we know what ideals are uppermost in the minds of this selected body.

If we look about us we may see to what extent these ideals are realized in actual practice. The inception of the pharmaceutical society is a step toward the ideal. Standardization simply means measuring by the ideal. Education is based upon the ideal. For over fifty years the pharmacists of this country have labored for a pure food and drugs act, and in its accomplishment June 30, 1906, a long step was taken towards the ideal. This act marks a new era, and already means advancement for the druggist.

One method of treating this subject would be to discuss those things which are not ideal—the dirt, waste, dead stock, cut rates, poor quality, poor buying, poor advertising, lack of training, bad habits, smallness of ideals; but such discussions only do harm, and let us be the last to discuss our own weaknesses and failings; rather let us suggest the higher possibilities.

Suppose that all druggists were to unite to standardize the drug business and that we begin with the educational field.

Suppose that we establish in each state a School of Pharmacy supplied with complete laboratories for the manufacture of standard pharmaceuticals, and that we graduate from these schools students thoroughly prepared to perform all classes of work connected with pharmacy.

Suppose that these schools, carried on in this manner, were to be self-sustaining through their laboratories, by the support of all the druggists of the state through the use of the laboratory products, and that all students who show a high grade of work and earnest effort be given an opportunity to earn their own way through such a college provided they pursue a four years' course, followed by a year of post-graduate work in a school provided for that purpose by the National Government.

Suppose that the work on the Revision of the Pharmacopœia were to be allotted to all of the seventy-five thousand druggists in business, laboratories and schools, and the results were to be tabulated by committees who in turn would forward these tabulations to the revision committee.

Suppose that these in turn were to be exchanged all over the world, and the final compilation and data concerning each chemical and pharmaceutical were to be placed on separate cards for distribution to all who participate, thus making available immediately the results of investigations concerning any one item.

Suppose that, after the year 1915, all persons who have not already been licensed to practice pharmacy should be required to have graduated from a four years' course in pharmacy in one of these state schools, and that those who have finished the post-graduate course be given the preference.

Suppose that all druggists and chemists, whether retailers, wholesalers, manufacturers or teachers, form one great organization—"not a trust."

Suppose that all legislation concerning drugs or chemicals were to be submitted to a legal department of this organization, no difference where such legislation may have originated.

Suppose that an advertising department determine what goods shall be handled and in what manner they shall be introduced, and that pharmacists thus obtain a share of the enormous sums now expended in this line.

Suppose that druggists refuse to sell any new preparation until it has a certificate of its merits and actual contents from a board appointed by this organization.

Suppose that there were but one form of label for standard pharmaceuticals, so that retail druggists would need to carry no duplicates.

Suppose that but one price be charged pharmacists for a drug or a preparation plus the actual cost of delivery.

Suppose that an exchange system among druggists be established that no dead stock may accumulate.

Suppose that the druggists make themselves the only reliable source of

information for the community, concerning drugs and chemicals, by furnishing the public literature under the censorship of a board of trustees selected from their organization.

Suppose that there were no *cut-rate signs* to lower the standing of the druggist in the minds of his customers.

Suppose that no physicians be allowed to fill a prescription except in an emergency, and that no druggist be allowed to re-fill a prescription unless so stated on the original.

Suppose that all drug stores in the cities close at 7.00 p. m., and that emergency stores be maintained, the profits and losses from which to be equitably distributed among the stores maintaining them.

Suppose that our windows were filled with flowers and our stores with pleasant perfumes instead of with tangle-foot paper and flies and the foul odors of the accumulation of years.

Suppose that a great vacuum cleaner should be applied to many of our places of business to draw therefrom the dust, and perchance even to the extent of extracting at least a part of the condition of selfishness and jealousy which has so long interfered with our own advancement.

Suppose, in brief, that, in leaving behind these things of poor report, we press forward to the mark of our high calling. Then the pharmacist will receive his just credit and have as high a standing as any man or woman in any profession, and pharmacy will be "the ideal profession."

Los Angeles, August, 1909.

A BRIEF SKETCH OF THE PERFUME INDUSTRY.

BY P. HENRY UTECH, PH.G.

The custom of employing fragrant, aromatic and odoriferous substances for perfume has been in vogue from time immemorial, and back in the ancient days no great event or ceremonial, either public or private, but what either perfume or incense of some sort was a conspicuous feature of the occasion. Innumerable biblical references and allusions to its use are to be found scattered throughout the entire Scriptures.

Perhaps the earliest authentic account of which there is any record occurs in the second book of the Pentateuch in the command given unto Moses: "Take unto thee sweet spices, stacte, onycha and galbanum; these sweet spices with pure frankincense: of each shall there be a like weight. And thou shalt make it a perfume—a confection after the art of the apothecary." Here we have what might with propriety be called the "original recipe" with all of the ingredients mentioned, their exact proportions stated, and finally, in order that the finished product shall measure up to the exigencies of the case, the instruction is given to have it prepared by an apothecary secundum artem.

Among the early Greeks and Romans it was the custom to use not only

flowers but perfumes also in many of their ceremonials and festive occasions. Homer in his Odyssey declares that the Egyptians of his time were emphatically a nation of druggists, being skilled in the preparation of perfumes, cosmetics and fragrant balsams.

Evidently perfumes were held in high esteem in the ancient days, for we find an instance recorded by Herodotus about 430 B. C. how Cambyses as a token of regard presented a prince of Ethiopia with an alabaster box of perfume. And later Plutarch tells us of a certain compound—kuphi by name—which was composed of sixteen ingredients and much used by the early Egyptians, "whose sweet odor had a benign physiological affect on those who offered it." And instances of this character showing the use in some form or other of rare and costly perfumes are to be found all through the pages of history.

But the cultivating of flowers for perfume as an industry is of comparatively recent origin. It appears to have been undertaken in the early part of the nineteenth century in central Italy round about Florence, from whence it gradually extended northward across the border into southern France—in the Riviera region—in which district it is extensively carried on at the present time, forming the chief occupation of its peasantry. Here the flowers, particularly roses, jasmine, cassie, and violets are grown in enormous quantities and still the production, even in the most favorable seasons, falls short of the demands of the market. Being solely dependent upon favorable weather from one season to another for a successful crop, the amount of production annually is always a matter of speculation. Another very objectionable feature is this: If the weather during a certain season happens to be very dry the composition of the floral oil is rich in some of its constituents; should a wet season occur or a difference in temperature, the oil is entirely different in composition and character. The physical constants of the various oils show such a wide variation from one year to another that on this account the last revision committee of the U. S. P. has wisely incorporated a series of tests for many essential oils based either on the ester, aldehyde, or stearopten content of the oil as the case may be.

Various methods of extracting the odorous substances from plants and flora have been employed from time to time, some of which distillation and expression for example being of very ancient origin Other well known processes are those of enfleurage, maceration, extraction with volatile solvents, etc., etc. This latter process is the one most largely used at present, and with the discovery of purified methyl chloride as an extracting agent a few years ago, much progress has been made in isolating these fragrant, odorous and aromatic principles directly from the flower in all their natural delicacy and aroma. Briefly, the process consists of digesting the flowers in the ethereal liquid for only a few minutes, the liquid thus obtained being carefully manipulated at low temperature,

resulting in the concrete perfumes or floressences. These in turn are diluted with the ordinary cologne or perfumer's spirit blended and mixed, set aside to develop, producing in the end the triple or quadruple extracts usually marketed by the perfumer.

The continual embarrassment caused by the failure to secure a sufficient supply of natural floral oils and pomades has compelled the manufacturing perfumer to seek elsewhere for an available source of new material It follows therefore very naturally that the development of the synthetic perfume industry has come about as the logical solution of existing conditions.

Realizing the wide commercial application of this industry, the synthetic chemist has been unusually active in his endeavors to supply the several missing links. The achievements in this particular sphere of activity have been nothing short of marvelous, and the industry is as yet apparently only in its infancy. By this means many of the more subtle creations of nature are now reproduced with remarkable fidelity both as to fragrance and exquisite delicacy of odor. A still more important feature of the industry is that it is now possible to obtain products of definite and uniform composition and at a definite price, which cannot possibly be the case with substances obtained from natural sources.

A few of the more common odors now prepared from artificial sources are the various rose odors in all their delicate shadings, such as red rose, tea rose, moss rose, white rose, tube rose, etc., etc.; also heliotrope, lilac, ylang-ylang, crab apple, lily of the valley, some very delicate violets—which as yet are apparently the "philosopher's stone" of the synthetic chemist—the orange blossom in its entire freshness and delicacy, to say nothing of the endless combinations of these and allied substances which go to make up the various grades and qualities.

The difference in cost of many of these odorous substances is also quite noteworthy. Some of the artificial products, such as nitrobenzol for instance, which is used as a flavoring agent for cheap soaps, can be had for a few cents per pound, while the natural violet flower oil if obtainable is estimated to be worth upwards of $7000.00 per pint. Considering this latter figure, it is little wonder that the subject of reproducing this subtle elusive substance from artificial sources should be the quest of that modern miracle-worker—the synthetic chemist.

Were it not for the progress already made along these lines, it is impossible to conceive just what particular trend this industry would have taken. Certain it is that the results thus far achieved have been very successful, both commercially and financially, which factors have given encouragement, inspired hope and incentive for even greater achievement. In the light of the work which has thus far been accomplished, we can already hail the day when science will step in and supply us not only with the means for the gratification of our physical senses, but an approach at

least to the very substance of life itself. Nevertheless, be that as it may, the debt which manhood owes to the synthetic chemist, already inestimable, will ere the lapse of many years certainly be high above value and great price.

COMPOUND RESORCIN OINTMENT.

BY J. O. BURGE, SR.

Much has been written about compound resorcin ointment and many different methods of preparing it proposed. I find the process given below never fails in giving a nice, smooth ointment. Having to prepare 100 samples of this ointment for the propaganda work in this city, I thought it a good opportunity to experiment a little, and so tried several of the processes and suggestions I found in my journals, with results not very satisfactory. My principal trouble was to get a smooth mixture. When the melted paraffin and petrolatum were added to the other ingredients it would cake up in spite of all I could do, so in thinking how best to remedy this it occurred to me to melt the two together and stir until cold. While at work on this I thought of mixing the oil of cade with it and calling it "Ointment of Cade." With this made, any prescriptionist can, in a short time, by substituting grains for parts in the formula and multiplying by four, make approximately an ounce of the ointment and send it out fresh on his prescriptions.

I then began studying the best method of incorporating the other ingredients. It was hard to make a fine powder of the resorcin, but it is very soluble in water; so to get the water for this I took the anhydrous wool fat, using part of the water directed by the U. S. P. to be used in hydrating it, to make the solution, and the remainder to make a smooth paste of the zinc and bismuth salts. I then constructed the following formula:

IMPROVED PROCESS FOR COMPOUND RESORCIN OINTMENT.

Take any convenient quantity of paraffin, petrolatum and oil of cade in the proportions called for in the N. F.; melt together on a water-bath; when liquid remove from the bath and stir until congealed. Label this "Ointment of Cade." Then to make compound resorcin ointment—

Take of Ointment of cade	47 parts.
Anhydrous wool fat	25 parts.
Resorcin (U. S. P.)	6 parts.
Zinc oxide	6 parts.
Bismuth subnitrate	6 parts.
Water	10 parts.

Put the resorcin in a test-tube, add four parts of water, warm until dissolved. Put the zinc and bismuth salts in a mortar, triturate with the remaining six parts of water to a smooth paste. Then add the anhydrous

wool fat and mix thoroughly. Add the solution of resorcin and triturate until a smooth, homogeneous mixture results, add the ointment of cade and mix well. This gives 100 parts of a smooth ointment.

ELIXIR GENTIANÆ GLYCERINATUM.

BY J. DINER.

Assuming, of course, that it is not the intention of the National Formulary Committee to imitate any similar preparation, there seems to be no reason why a multiplicity of flavoring and sweetening agents should be employed in the making of this preparation, nor seems there to be a valid reason why fluidextracts should be employed. Inasmuch as the compound spirit of orange furnishes a pleasant and palatable flavoring principle for most of the official elixirs, I would recommend that it be also used in this instance, and I find after a number of experiments that the crude drugs furnish better results than the fluidextracts. For these reasons I would suggest the following formula:

Powdered gentian	160 grains.
Powdered taraxacum	240 grains.
Acetic ether	75 minims.
Phosphoric acid	128 grains.
Compound spirit of orange	240 minims.
Glycerin	16 ounces.
Sherry wine, to make	32 ounces.

Mix the liquids, moisten the powders (mixed) with part of menstruum, and proceed with maceration and percolation *lege artis*, keeping percolator well covered to avoid evaporation of acetic ether and alcohol of the wine.

A POINT IN PROFESSIONAL COURTESY.

BY LEONARD A. SELTZER, DETROIT, MICH.

Among the perplexing questions which arise from time to time for the pharmacist to solve, those pertaining to his relation to the physician and his patient, are sometimes the most perplexing and difficult of solution. Some of these questions have received more or less discussion, but few have been satisfactorily solved owing to the different points of view which are taken.

The question which I am about to discuss presents a peculiar paradox. It is in the first place easy of solution because the medical profession is almost unanimously on one side of it, and in the second place because druggists' interests are in no way antagonized by compliance. But notwithstanding this fact druggists generally are acting directly contrary to the wishes of physicians, and, strange as it may seem, at the request of the physicians themselves.

The question is, What shall a pharmacist do when asked by a physician for information concerning a prescription written by another?

The present writer has for many years been in very close contact with quite a number of physicians, and has intuitively felt that a majority of them consider their prescriptions to be of a confidential nature, something like private correspondence, and should not be open for inspection, either to the public or other physicians. Nevertheless he has often been placed in the embarrassing position of having to refuse to give information asked for, and usually at such times he has been told that the inquirer has never been refused such information by any druggist before. In order to make sure that his position was correct, the following letter with enclosure was sent to a number of physicians. The list was confined strictly to men of his personal acquaintance, and were men of highest standing in their profession and in the community. This precaution was taken in order that the result might reflect the broadest and most strictly ethical view obtainable. The following is the letter:

DEAR DOCTOR: It not infrequently happens that pharmacists are called upon by their physician friends to give information concerning the ingredients of prescriptions which have been intrusted to them and are on their files, but written by another physician.

In view of the delicate position in which pharmacists are placed under these circumstances, I am writing to you and a number of other physicians to find out if possible what is your and their attitude on this subject, not only for the benefit of myself and other pharmacists who are conscientiously striving to do right by everybody concerned, but that I may know your wishes relative to your prescriptions which may be brought to my store.

I am inclosing a printed slip with three questions, and in order to classify answers I have included affirmative and negative replies. The one with which you do not agree you will please draw a line through. Should you care to answer more fully, I assure you I should be pleased to receive such a reply, and in any case shall consider your replies strictly confidential.

Very truly yours, LEONARD A. SELTZER.

I. To whom should the physician, desiring information concerning a prescription, apply for such information?

Ans. { *The pharmacist who filled it.* / *The physician who wrote it.*

II. Shall the pharmacist under any circumstances give the above information provided it is possible to consult the writer?

Ans. { *Yes.* / *No.*

III. Do you wish your prescription to be considered confidential by pharmacist holding same?

Ans. { *Yes.* / *No.*

Sixty-six such letters were sent out, and 43 votes were returned. On the first question, 36 votes or 80 per cent. indicated that the author of the prescription should be referred to. Four, or less than 10 per cent., that the pharmacist should give the information; one that either might; one that neither should be asked for it; one voted indefinitely, "That depends." On the second question 36 voted negatively, of which four made exception of cases of toxic poisoning and emergency; one excepted the con-

sultant on the case at the time; five (5) voted affirmatively, two indefinitely; one saying "possibly," and the other "under certain circumstances."

On the last question 39 voted affirmatively, 4 negatively.

The following conclusions seem evident:

1. From the percentage of returns and the discussions created, it is a question on which the profession is not indifferent.

2. Almost unanimously they consider it a breach of courtesy for one to ask information concerning the prescription of another from a third party instead of the writer.

3. Whether this attitude on the part of physicians is right or wrong is not for pharmacists to decide.

The fact is it is their attitude, and knowing it to be so, he has no right to yield to requests for information unless the writer cannot be consulted and the interests of the patient demand it.

While the discussion of the motives of the physicians taking this stand is not in our province, the letters which accompanied the votes give some data which it might be well to consider.

In several cases those voting in minority seemed to think that to hold other views was to advocate secrecy, the necessity of which was incompatible with the conception of the medical profession as made up of gentlemen, maintaining the ideals and ethics of their profession.

The majority, on the other hand, seemed to think it to be a matter of courtesy due the author that he should be consulted if any information was wanted concerning his prescription. Moreover, as one expressed himself, the information that could be had by simply seeing a prescription would be too incomplete or even misleading, and might lay the writer open to unjust criticism, which if he were consulted he would be able to explain. Moreover, this party desired the opportunity to give the complete information which he possessed as the result of his experience on the case.

The question naturally arises in the minds of some of the majority whether in seeking information from other sources than the author the inquirer is not, in some cases at least, doing so because for some reason he desires the information without the author's knowledge. The present writer has had some requests come to him which he surmises might not have been made had the writer of the prescription been present. It is, moreover, not improbable that pharmacists complying with requests would do so less readily if the author were present.

The situation so far as the pharmacist is concerned is simply this: If the medical profession is, as we hope, composed of gentlemen all thoroughly candid and open in their views, and fair in the treatment of each other, then there can be no possible objection for one of them to ask another for such information as he may desire. If, on the other hand, there

is lacking in any degree this cordiality and confidence which we all know would be ideal, then the duty of the pharmacist not to meddle in is very evident. In the first place, his help is not needed; in the second it is available only with dishonor and betrayal of trust.

MINUTES

OF THE

SECTION ON HISTORICAL PHARMACY.

FRIDAY MORNING, AUGUST 20, 1909.

The first (and only) session of the Section on Historical Pharmacy was held at the Hotel Alexandria, and was called to order by Chairman J. B. Bond, of Arkansas, at 10:30 a. m.

The Chairman said it was his good fortune to be able to offer the members a very pleasant and unique surprise—one that would be recalled in future years with much satisfaction, under the trying circumstances they were then likely to encounter. During this delightful convention they had heard addresses and speeches galore, and possibly some had been tiresome, and he said it was his purpose to let them off, without listening to another. So he was able to inform the Section that he had no address to read upon this occasion. Sometimes the custom was more honored in the breach than in the observance, and he would make this such an occasion. He felt that the popularity he would gain by this act of self-abnegation would cause his name to at least have "prominent mention" for the highest office in the gift of the Association. But he cautioned the members that if such a remote contingency should occur, he might be moved to display his real erudition, with all the prolixity of a Remington or an Oldberg, and he feared the members would not be the gainers thereby. He thanked them for the honor conferred, and for their great cordiality upon this occasion. He said the Association would now proceed to business, and asked for the pleasure of the members.

The Secretary stated that the first order of business was the reading of the report of the Historian, and the Chair called upon Secretary Eberle to present this report, in the absence of Mr. Edward Kremers, Historian of the Section on Historical Pharmacy:

REPORT OF HISTORIAN.

The work of the Historian during the past twelve months has taken its usual course: the collection of new material and the classification of material already in hand, so that it can be properly stored and used.

In the collection of material two members of the Association have continued to take a special interest. Mr. Mayo has sent a number of photographs, and Mr. Whelpley has sent miscellaneous documents, as well as forwarded several boxes of documents collected by ex-treasurer S. A. D. Sheppard.

In the work of arranging material on hand, your Historian has been ably seconded by Miss Nellie Wakeman. At the Hot Springs meeting the Council voted $25.00 for mounting paper and an additional $25.00 for clerical assistance. In order that this work be made effective it ought to be continued without interruption. At the present rate of progress the material now on hand cannot be gotten into a proper working condition within ten years. It is to be hoped, therefore, that the Section will request the Council to make a like appropriation for next year.

The transfer of Ex-Treasurer Sheppard's books and papers and their deposition with the Historian suggests the consideration of the advisability of having the books, correspondence files and other papers of all of the officers of the Association at large and possibly of the sectional officers, transferred to the archives of the Association after the lapse of a given number of years.

No doubt much material that would shed considerable light upon the past history of our Association and of American pharmacy at large has been lost or even willfully destroyed. The use of such material should be suitably restricted by special action of the Council or of the Association in general session assembled.

Another matter which ought to receive the immediate attention of the Section, and later of the Association at large, is that of a library. Upon inquiry your Historian has learned from the General Secretary that but few of the organizations which receive complimentary copies of the Proceedings send anything in exchange. This state of affairs is as undignified as it is extravagant. Your Historian would therefore urge that this Section recommend two things to the general session.

1. That the General Secretary be instructed to discontinue sending copies of the Proceedings to sister associations and other organizations that send no publications of their own in exchange.

2. That the office of Librarian be established, and that a Librarian be elected by the Council. In co-operation with the General Secretary and a member of the Finance Committee, it ought to be his duty to receive as large an exchange list as possible, and thus to build up a library for the Association. Inasmuch as Washington is to be the home of the historical collections in the near future, it might be best to elect as Librarian a member from that city. Whether such a library had better be placed with the Washington Section is a matter to which the Historical Section should give due thought before making a recommendation to the general session. If one reflects how many books and pamphlets have been lost to the Association in the past fifty years and more simply because there was no one whose specific duty it was to preserve them, it takes but little imagination to construct a library of great value that we might have had.

In accordance with a suggestion made by your Historian to the President, the Chairmanship of the Committee on our historical collections at Washington was transferred to a member resident in that city. We may expect, therefore, that our interests in that direction will be carefully guarded now that the National Museum is approaching its completion. As soon as the Old National Museum building will have been reconstructed, it will be necessary to transfer our collections to Washington. At that time it may become necessary to appoint a custodian. Before this is done, however, a complete understanding with the Assistant Secretary of the Smithsonian Institute, who is in charge of the National Museum should be arrived at. Possibly this important matter can be turned over in due season to the Committee now looking after our interests at Washington. With a Librarian, a Custodian and an Historian, each an enthusiastic member in his particular field, our historical interests ought to be well taken care of in the future.

To recapitulate briefly. 1. The Section ought to ask for the continuation of the assignment of the regular allotment for historical work, as given above. 2. Our exchanges ought to be placed on a dignified basis and the most ought to be made of this possibility to create a library. 3. The advisability of creating the office of Librarian ought to be carefully considered.

Respectfully submitted, EDWARD KREMERS, *Historian.*

The Chair called for action upon the report just presented, and suggested that there were two or three recommendations made in the paper.

The Secretary said he thought these ought to be referred to the Council at once for action, as the Council was in session and the time was limited. Mr. Hays so moved.

Mr. Schneider thought the suggestions should be taken up *seriatim* and disposed of, and it was so ordered.

The Secretary read the first recommendation, to the effect that the allowance of $50 per annum for clerical assistance heretofore voted by the Council should be continued.

Mr. Hays said his only objection to this was that the allowance was too small; that it would take ten years to do the work upon that basis. Thereupon Mr. Howell, of North Carolina, moved to make the appropriation $100 for the benefit of the Historical Section. This motion was seconded by Mr. Schneider and carried.

The Secretary read the second recommendation, which was that the exchange of Proceedings be placed on a more dignified basis, and that copies of the Proceedings of this Association be hereafter furnished only to sister associations and organizations that send their publications in return, and that the General Secretary be so instructed by the Association in general session.

Mr. Hays moved to refer this recommendation to the Council, and the motion was seconded by Mr. Schneider and carried.

The Secretary stated the effect of the third recommendation, that the office of Librarian be established, that officer to be elected by the Council, and with the recommendation that he be selected from the city of Washington or from that vicinity, for the reasons stated in the report.

Mr. Hays also moved to refer this recommendation to the Council, and the motion was seconded by Mr. Seltzer and carried.

Mr. Ladish volunteered to take these recommendations to the Council forthwith, with the information that the Historical Section had adopted them.

The Secretary here gave notice that any donations of a historical nature would be gladly received, and if promptly turned in would be sent to the Historian with other matter in a large box he was preparing for shipment.

The Chair stated that the next order of business would be a paper by Mr. Schneider, of San Francisco, on the History of Belladonna Culture.

Mr. Schneider explained that the paper was unfortunately before both the Scientific and Historical Sections, and that he had abstracted it last night before the Scientific Section. As this was the case, and the weather was warm and the time allotted to the Section short, he said he would, if agreeable, only give a short abstract of it here. This he proceeded to do at the invitation of the Chair.*

The Chair invited discussion upon the paper just presented.

Mr. Steele, of San Francisco, said he always understood that plants of that nature acquired new and magnified properties, physically and chemically, when grown in the California climate, and he presumed the same would hold good of belladonna. He had been told that the plants grown in this section were much stronger than those grown in the East, and so it would seem that this climate acted favorably upon such medicinal plants. In all his investigations in botany the facts seem to illustrate the truth of Darwin's statement that some people are inclined to draw a fine distinction where no real distinction existed, and to make varieties of species and draw a fine distinction between variety and sub-variety; and in his opinion the botanist should be careful about attempting to put new varieties into botanical literature. He related a personal experience in connection with grindelia to show the extremes to which this tendency may be carried.

Mr. Schneider said with regard to the alkaloidal yield of belladonna in general that it ran from .4 per cent. in the stem and leaves up to as high as .8 per cent. He had not tested many roots, and so he really could not say how they would run, but it seems to run considerably higher than in the European plants, and perhaps a little higher than plants in the East. Commenting on Mr. Steele's remarks in regard to the wonderful fertility of California, he said he did not want to say very much, because he was not a native of the State. This was his sixth year in California, and he was very much interested in things that happened here. As illustrative of the fertility of the soil of California, he said all were familiar with the lemon-verbena of the East, where it is quite a small herbaceous plant about a foot high while here it grows into trees 15 or 20 feet high. Sugar beets, which in the East yield some 12 or 14 tons to the acre, here yield 18 to 20, and even as high as 24 tons to the acre. The sugar yield in the East is some 14 or 16 per cent., while here it is 16 or 18 or 20 per cent., and even runs as high as 24 per cent. Here there is a growing season of twelve months, and furthermore the soil is unusually rich. Here, he said, we have an adobe soil, which, when cultivated at the wrong time, is very much like tar or rubber; but if worked at the right time, is mellow and pliable. The adobe houses that the members had seen about the country were made out of this soil. When exposed to the sun and baked it turns almost as hard as rock, making an excellent building material.

* The full text of the paper appears on p. 833 *et seq.*—The General Secretary.

Mr. Hays asked what was the difference between the belladonna for medicinal use and the flower-garden plant that used to be known as "deadly night-shade" in the South when he was a boy.

Mr. Schneider, continuing, said that when he arrived in California he made inquiries of several botanists in regard to belladonna, and they stated that the plant grew indigenously all over the State, and several private citizens said the same thing. This was an error, however, as he found. He conceived the idea of cultivating belladonna in California for the drug market, and entered into negotiations with Messrs. Johnson & Johnson, through their representatives in this section, Messrs. Waldron & Dietrich. Some good people came to Waldron & Dietrich and said that all of this experimental work of Schneider's was nonsense, that the belladonna plant grew without any effort whatever all through the State of California. One of them said that he had it in his backyard and couldn't get rid of it. And so he was asked to explain this which was simple enough as the plant these people referred to was not belladonna at all, but was *Solanum nigrum*, commonly called "deadly night-shade," a plant which was common throughout the world.

Mr. Schneider also explained the Burbank creation known as the "Wonderberry" which he said was a cross between the *Solanum nigrum* and the so-called Washington (state) huckleberry which is a first cousin.

The berries (fruits) of the wonderberry as well as of the Washington huckleberry make a delicious pie, which is non-poisonous; though the usual recommendation is to have the berries well cooked. The pie is delicious and tastes almost like a huckleberry pie.

The Chair called for action on the paper, and the Secretary moved that it take the usual course.

The Secretary explained that the papers presented before this Section were not usually published, unless there was some point that the Publication Committee considered as desirable to publish. He said the paper of Mr. Schneider was ordered printed by the Scientific Section. That being true, the paper would be taken charge of by that Section.

The motion to accept and to take the usual course was then put to a vote and carried.

The following historical papers were then read in abstract by the Secretary and upon motion, duly seconded, were referred to the historian and directed to take the usual course:

Albuquerque in 1880. By B. Ruppe.

Pharmacy in the Early Days of Los Angeles. By F. J. Giese.

Evolution of Pharmacy in Los Angeles in the 80's. By. C. Laux.

The California Pharmaceutical Association. By Jas. G. Steele.

The Apothecary—A Literary Study. By Edward Kremers.

A contribution to the Study of the History of Pink Root, by M. I. Wil-

bert, was the next paper called for, and Mr. Wilbert, before proceeding to abstract his paper, stated that there were several members present who had paid considerable attention to the cultivation of the pinkroot—notably Mr. Lloyd, Mr. Schneider and Mr. Richtman—and it was with the hope of eliciting further information on this subject that he would read a portion of his paper:

A CONTRIBUTION TO THE HISTORY OF "PINKROOT."

BY M. I. WILBERT.

Spigelia marilandica illustrates, as well perhaps as any drug now used, the interesting comedy of errors that may be developed by following up the history of the origin and uses of a drug that has passed through the vagaries incident to its empiric use in medicine.

Much of the confusion concerning this particular drug, and its adulterant, has been unraveled by W. W. Stockberger in his comprehensive and scholarly monograph on "Pink Root and its Substitutes" published in part in Bulletin 100 of the Bureau of Plant Industry and in full in the Pharmaceutical Review for 1907, also as a separate, by the Pharmaceutical Review Publishing Co., Milwaukee, 1907.

Stockberger, however, leaves two rather interesting questions unanswered, at least directly: (1) Who was the first to recognize the then common adulterant of Spigelia as *Phlox carolina?* And (2) What was the nature of the second "pink root" frequently referred to as having been in use in this country during the earlier decades of the nineteenth century.

I believe that the direct answer to the first question is to be found in one of the very few references that Stockberger appears to have overlooked in the compiling of his admittedly comprehensive bibliography of the literature on "pink root."

The first edition of the National Dispensatory (1879) in the monograph on Spigelia evidently written by Maisch says: "Spigelia is sometimes met with as an admixture of serpentaria, and is not infrequently found mixed with some few roots of several plants, doubtless from careless collection. A few years ago a very different root was seen in the market, which Dr. A. W. Miller (1875) ascertained to have been derived from *Phlox carolina*, Lin., which plant is known in some parts as Carolina pink. This root is lighter in color, the rootlets are straight or but slightly curved and their cortical portion is easily removed, exposing a straw-colored ligneous thread."

The first announcement of this adulterant appears to have been made at a pharmaceutical meeting of the Philadelphia College of Pharmacy, February 16, 1875, when "Dr. Miller presented a sophistication of Spigelia, to which his attention was drawn by S. W. Brown of Manayunk. Upon inquiry he learned it was known in the market as East Tennessee pinkroot; but the plant from which it is derived has not been ascertained. It is said to be largely sold to manufacturers of fluidextracts."

At the annual meeting of the American Pharmaceutical Association in Boston, in 1875, Dr. A. W. Miller, as Chairman of the Committee on Adulterations and Sophistications presented the final report, quoted by Stockberger, in which he gives a more detailed account of the adulteration of pink-root and records securing an additional supply of this 'so-called East Tennessee pink-root' from a commission merchant in Philadelphia.

Miller also reports addressing a letter of inquiry to Messrs. Wallace Bros. of Statesville, North Carolina who "have since been able to identify the sample as the root of *Phlox carolina* known with them as the Carolina pink."

From the available publications it would appear that the adulteration was brought to the attention of Dr. A. W. Miller by S. W. Brown of Manayunk and that Dr. Miller submitted samples of the root to Wallace Brothers who identified the same as *Phlox carolina*.

It is quite likely that the claim recorded by Stockberger as having been made by M. E. Hyams, is correct as a personal letter recently received from Dr. A. W. Miller recalls that a Prof. Hyams was formerly in the employ of Wallace Brothers, or affiliated with them as botanist and it is quite probable that the inquiry from Philadelphia was submitted to him so that the sequence would be complete and Prof. M. E. Hyams really the first to mistake, as True and others have pointed out, *Ruellia* as *Phlox*. An even more interesting question is the one as to the identity of the second pink-root used in eclectic and to some extent also in domestic practice during the earlier decades of the nineteenth century.

Dr. Benjamin Smith Barton, in his Collections for an Essay towards a Materia Medica of the United States, says: "The *Silene virginica*, or ground pink, as it is called in some parts of our country, is another native anthelmintic. A decoction of the root is used, and is said to have been found a very efficacious remedy." In a footnote Barton says: "From the information of my friend, the late Dr. James Greenway, of Virginia."

Dr. John Redman Coxe, in the early editions of the American Dispensatory, says: "*Silene virginica*, ground pink. This species of *Silene*, or catch fly, is abundant in many parts of the United States. Some of the Indians say it is a poisonous plant. In decoction the root has been found to be an efficacious anthelmintic."

Many other early writers on American Materia Medica mention this particular member of the Pink family, which appears to have met with some use both at home and abroad, and may, in part at least, account for the practice observed by Flückiger and Hanbury, who note that *Spigelia*, or pink-root, is sometimes erroneously Latinized in price lists as "Radix Caryophylli."

In some of the early eclectic works on materia medica, *Silene virginica* was recommended as a vermifuge and a nervine. It was popularly known as ground pink, pink catch-fly, fire pink, wild pink and Virginia pink. No

reference to the use of this root could be found in recent literature, and an inquiry addressed to some of the larger herb dealers in the country failed to find a single one who had any knowledge of the drug or its uses, and practically the only available reference to it of recent date is the continuation of a rather misleading notice in the United States Dispensatory.

The earlier editions of the United States Dispensatory say: "*Silene virginica*, catch fly, wild pink, an indigenous perennial plant growing in western Virginia and Carolina, and in the States beyond the Allegheny Mountains." Dr. Barton, in his "Collections," states that a decoction of the roots is said to be efficacious as an anthelmintic. We are told that it is considered poisonous by some of the Indians. The *S. pennsylvanica*, which grows in the eastern section of the Union from New York to Virginia, probably possesses similar properties.

The nineteenth edition of the United States Dispensatory (1907) says: "*Silene—Silene virginica* L. (family *Caryophyllaceæ*)—catch fly, wild pink." The wild pink of West Virginia and the Carolinas was considered by the Indians poisonous and by Barton an anthelmintic."

The latter description is short, positive and pithy, and is evidently the product of shears and blue pencil, but would it not be more in keeping with a book of reference to delete it entirely or to reconstruct it and allow it to appear as a memorial of a one-time popular remedy that, as Hollembaek and others assert, was frequently employed as a substitute for the *Spigelia marilandica*?

And this suggests that ponderous tomes like the United States Dispensatory frequently do contain much that is interesting and amusing if you know, and sadly misleading if one unwittingly relies on them for the information that they are expected to contain. Reverting for a moment to *Spigelia*, it will be worth the while to read Stockberger's monograph on this drug and then to peruse the peculiar conglomerate of old and new that is presented in the United States Dispensatory as a description for this drug.

Among the interesting pieces of information still offered that had their origin before the Civil War, probably before the introduction of railways, is the reference to the emigration of the poor Indian and the marketing of *Spigelia* in huge casks or bales from St. Louis by way of New Orleans, and the added piece of information that "That contained in casks is to be preferred, as less liable to be damp and mouldy."

Another interesting bit of information is the assertion that, "It is frequently necessary to separate the spigelia from the various adulterant roots. Among the most important of these may be mentioned the roots of certain small vines which frequently twine around the spigelia stem; these roots can be distinguished by their being long, slender, crooked, yellowish, thickly set with short capillary fibres and much smaller and lighter-colored than is pinkroot."'

This statement is evidently taken from James Ewell, physician in Washington, formerly of Savannah, who early in the the nineteenth century expressed the belief that the deleterious effect was in consequence of the root of this particular vine.

John Rodman Coxe, in the 9th edition of the American Dispensatory, refers to this statement made by Ewell and quotes a letter from a Mr. Porcher, who controverts the theory and quotes a Mr. Stephen Elliott as being of the opinion that the poisonous property observed is characteristic of spigelia itself.

It would appear desirable that granting that "commentaries are to be simple compilations, they be so labeled, and that wherever possible the original reference or the approximate date be appended so as to give at least some indication of the reliability of the information offered.

Mr. Howell, of North Carolina, said he would send the writer a sample of each of these pinkroots next spring, as he had both of them.

Mr. Schneider here confessed to having had the unpleasant experience of having confounded ruellia with spigelia, and was much shocked when he made that discovery. He said, however, that he felt very much better when he found that a number of others had made the same mistake.

Mr. Lloyd paid Mr. Wilbert the compliment of saying that when he wrote a paper there was not much, if anything, to be added to it. He did want to say how much it pleased him to know that he had taken up this subject of doing tardy justice to the memory of John M. Maisch, who had been credited with this error of confusing spigelia with ruellia. He said he had had personal knowledge of Maisch's work at the time and knew how carefully and conscientiously he did his work. To hear thus authoritatively that he did not make that mistake was a great satisfaction, although he never believed it a moment. It had never occurred to him that Maisch could have made it, knowing the care with which he did his work. Mr. Lloyd referred to the tendency of compilers to forget the references made by the writer whose books they study, and to attribute statements duly credited therein to the author of the work. Spigelia, or pinkroot was once a domestic remedy in early years, used somewhat by eclectics, but when less nauseous and better preparations came in, they abandoned it. It is very seldom used in domestic medication to-day, and is of no consequence in the compounds that are now regularly used in eclecticism. It is one of the more obsolete remedies, and properly so, because it may be accepted that better remedies to accomplish the same purpose have succeeded it. He called attention to a pamphlet on pinkroot emanating from the Philadelphia College of Pharmacy during the early part of the last century, which he said was a very interesting work on spigelia. Mr. Lloyd concluded by saying that his real object in rising to speak was not to discuss the subject, but to thank Mr. Wilbert on behalf of his departed friend

" for having relieved him of that which ought never to have been placed at his door."

Mr. Wilbert said that he had been informed that the eclectics believed in the use of spigelia, and he would like to ask Mr. Lloyd if, in his memory, spigelia was ever extensively used by them.

Mr. Lloyd's reply was, " Never in large amount; it was a mistake to call it an eclectic drug."

The Chair called for action on the paper presented, and Mr. Ladish moved that it take the usual course.

The Secretary asked Mr. Wilbert if he thought the paper should be submitted for publication.

Mr. Lloyd said he thought the statement of fact in regard to Maisch should be referred for publication.

Mr. Wilbert said he wanted it clearly understood that John M. Maisch was not the originator of the mistake in regard to ruellia, and if such a statement of fact could be made through the Proceedings he would appreciate it. He would be willing to leave that to the Historian, however, the man who takes charge of the papers.

The General Secretary stated that, as Chairman of the Publication Committe, he would like very much to have the Section decide what papers should be published. He stated that in past years, since the creation of the Historical Section, there had been some little difficulty on this score: that the Historian collects and keeps the papers in the archives of the Association, and once or twice he had been written to and asked why certain papers had not been published. He wanted the Section to designate what papers were to be published, and which not, and he could then say it was by order of the Association.

The Chair stated that the next matter would be a series of papers by Mr. E. V. Howell, of North Carolina, on the following subjects:

Remarks on the Crude Drug Business of North Carolina.

The Materia Medica of Dioscorides, with Photo of Translation in 1598.

Poppy Cultivation for Opium.

Establishment of a Botanical Garden in North Carolina in 1800.

Lists of Druggists in North Carolina in 1870.

These papers were presented in brief abstract, by Mr. Howell, who remarked that they might be referred to the historian, but contained no special points for publication.

Mr. Wilbert asked Mr. Howell if he had been able to locate the Micheaux gardens—Micheaux, who had come to this country in the latter part of 1800, and established a garden near New York City, and who afterwards went south and established a garden there, the situs of which he understood was somewhere near the city of Charleston, South Carolina.

Mr. Howell replied that this garden was located about six miles from

the City of Charleston, but that its exact situs was hard to tell. Some of the trees planted by Micheaux are still standing, but the place does not remain intact as a garden. The garden is not far from the famous Shepherd tea garden.

Mr. Richtmann added by way of explanation that if Mr. Wilbert would communicate with Dr. Chas. E. Shepherd, of the Pinehurst Tea Farm, South Carolina, he would get specific information. He said that Mr. Shepherd at one time took him to what he said was the site of the old Micheaux garden, and showed him the trees planted by Micheaux there. He thought it was about eight miles from Charleston.

The Chair stated the Association was thankful to Mr. Howell for the work he had done, and the Chairman felt especially grateful to him for having "come to the rescue," as he put it. He invited remarks upon the papers just submitted.

Mr. Schneider said that about the year 1905 he collected some opium prepared in the manner described by Mr. Richtmann, of the Department of Agriculture, that is, by cutting off the plant near the surface of the soil, expressing the juice, etc. He thought it had a peculiar sweetish odor, like that of "smoking opium," as it is called. He said an analysis had been made of the substance by one of the students of the California College of Pharmacy, which would indicate that it contained from four per cent. to eight per cent. of alkaloid. He was always a little skeptical about analyses made by students, although the work in this case was done under the supervision of a professor of chemistry, and he really had no reason to doubt the results given. But on the strength of what had been said by Mr. Howell here, he was inclined to believe that the above estimates were unusually high. He had intended to bring samples of that opium here, but had forgotten them. The opium that he collected this year had the same general appearance as that of 1905. Of course when prepared in the manner described it contains a large quantity of chlorophyl. It has no narcotic odor, and does not have the odor or taste of the commercial opium. In response to a question by the Chair as to how much morphine it contained, Mr. Schneider said that he had not assayed the product as yet.

Mr. Richtmann, referring to the government work along this line, stated that he thought it would be a wrong statement to say the Department had been engaged in the manufacture of opium in this country. During his four years of connection with the Department—and he thought since that time—the work had been solely with the object of obtaining morphine directly from the poppy plant without any reference whatever to opium. The method has been outlined of taking the poppy capsule and extracting the alkaloid, etc. The Department has never applied, and never thought of applying, the term "opium" to the intermediate product. The investigation had been directed solely to obtaining morphine product from the

poppy plant, and not for the purpose of obtaining opium. In reply to a question by Mr. Schneider as to whether they took the heads or the entire plant, Mr. Richtmann said the work had been done with the entire plant, but had been mainly concentrated on the poppy capsule. He did not know the state of the investigations at the present time, as it had been three years since he left the Department, but during that time they worked on all parts of the plant with the exception of the root. They worked with the stems and leaves and the capsules separately and all together. He said he was not sure that he was correct in making the statement, but he thought in the past few years the Department had been able to get a sufficient quantity of material in the State of Washington, and it was believed with improved methods they would be enabled to obtain morphine from the poppy plants as grown in the State of Washington.

Mr. Wilbert stated that on a recent visit to the experiment gardens at Washington, he saw several hundred pounds of the poppy capsules, which were being worked up into an extractive, the object being to obtain opium alkaloids. This extractive had the appearance and the odor and taste of opium. The poppy capsules, when ground up, are extracted with an aqueous menstruum, and the extract evaporated to a dense consistency; that extract is subsequently to be worked over for opium alkaloids. The interesting part to him was this extract obtained, having the odor and taste of opium. The people conducting the work were not willing to give any information at the time, and he did not know the amount of opium alkaloids they obtained; but they have strong hopes that with a continuation of the cultivation of the poppy for seed, and the working up of the poppy capsule for opium alkaloids, that a good, economic process can be developed.

Mr. Howell here took occasion to say that the State of North Carolina was rich in crude drugs; that they had not less than ten thousand in that state—as large a variety as any other state in the Union, he thought.

The next paper on the program was one by E. A. Sayre, entitled, "The New Jersey Pharmaceutical Association, Continued."

The Secretary explained that for several years past he had been after this gentleman to write up the history of the New Jersey Pharmaceutical Association, and he had done this two years ago. The present paper was a continuation of that work. He said he had also requested different Pharmaceutical Associations of the country to take up this work, and he had quite a number of these at his home in Texas, all of which would be sent to the Historian later. He reminded the members present that the Historian would be glad to receive historic data regarding the various State Associations. He said the paper now before the Section was simply a compilation of matter connected with the New Jersey Association, and he did not consider it necessary to read it. He also had a detailed statement of the growth of the Ohio Pharmaceutical Association, which had been presented by Theodore Wetterstroem, and that also would take the usual course, without objection.

Both papers were on motion referred to the historian.

The Secretary stated that since coming here, Mr. F. B. Hays had prepared a paper on the meeting at San Francisco twenty years ago. He said he had a list of all the members present at that time, and had obtained information regarding those still living and those who had died since that meeting. He thought the members would find it a very interesting historical reference.

Mr. Hays said he would not read the list—indeed, the paper was not yet complete. He said, however, that he would read the introductory part and a few extracts from the paper, which was entitled, "The Other California Meeting."

Mr. Searby stated in connection with the matter brought up by Mr. Hays, that he had the original record in his possession in San Francisco. He had written to a number of those who were present at the San Francisco meeting, and had received replies expressing their regret that they would not be able to attend this meeting. One of those from whom he had received an interesting letter was Gustavus Ramsperger, of New York, who was now eighty-six years old, and who had expressed himself as very anxious to be here, but thought the long journey would be too much for him to undertake. He said Mr. James G. Steele, of San Francisco, present at this meeting, was the oldest member of the American Pharmaceutical Association on the Pacific Coast. In response to his suggestion that he did not remember just how long Mr. Steele had been a member, Mr. Hallberg said fifty-two years. Mr. Searby then read a telegram received from the San Francisco Local Secretary at the 1889 meeting, which he read:

"Regret inability to attend meeting. With best wishes from your 1889 Local Secretary, E. W. Runyon."

Mr. Searby said Mr. Runyon was a very active man, and made a very excellent Local Secretary.

The Chair called for action upon Mr. Hays' paper, and the Secretary moved that it be completed and referred to the Historian. And this motion prevailed.

The Chair now called for nomination of officers of the Section for the ensuing year as the next order of business.

Mr. Wilbert put in nomination for Chairman that "elderly gentleman" all knew so well—having seen him repeatedly at the meeting for many years past, and whom the members hoped to see at the meeting for many years to come. He said he referred to Mr. E. C. Eberle, of Dallas, Texas, the present Secretary, of the Section.

Mr. Hays moved that nominations for Chairman be closed, and the motion prevailed.

Mr. Hallberg moved that the Chairman be instructed to cast the affirmative ballot of the Section electing Mr. Eberle, and this motion was

seconded by Mr. Searby and Mr. Schneider and carried. The Chair announced that he had very great pleasure in casting the affirmative vote for Mr. Eberle as Chairman, and declared him duly elected.

Mr. Caspari said he would like to make a countermove as to the "elderly gentleman," and would like to nominate for the office of Secretary of the Section a very youthful gentleman—a man who grew more youthful as he went down the road of time. He referred to Mr. John A. Dunn, of Brooklyn, a gentleman who had been deeply interested in practical pharmacy for many years, and in historical pharmacy likewise.

On motion of Mr. Wilbert, nominations for Secretary were closed, and Mr. Caspari moved that the Secretary cast the ballot of the Section electing Mr. Dunn. This motion prevailed, the Secretary announced that he had cast the ballot as directed, and the Chair declared the gentleman duly elected.

Mr. Wilbert said he desired to place in nomination for Historian of the Section Edward Kremers, of Madison, Wisconsin—"the only Historian the Section had ever had, and the only one available." This motion was seconded by Mr. Searby and several others, the Chair put the vote, and Mr. Kremers was elected by acclamation.

The Chair stated that the installation of officers was the next order of business, and asked Mr. Eberle "to arise and receive the news that he had been elected Chairman of this Section."

Mr. Eberle thanked the Section for the honor conferred, and said he would do the best he could for its interest.

The Chair next called on the Secretary-elect, and Mr. Dunn said that all he could say was that he highly appreciated the honor, and as Mr. Eberle was here to do all the work he felt safe in accepting it.

Mr. Schneider announced that Mr. Hallberg had a collection of Chinese drugs on a table in the convention hall and invited inspection of them.

Mr. Hallberg moved that the thanks of the Section be extended to the retiring Chairman, known as "Number One" in the State of Arkansas. There were several seconds to this motion, which was put to a vote by the Secretary and carried unanimously.

Chairman Bond said he felt very much gratified at the success of this meeting, and felt especially grateful to the gentlemen who had responded to his urgent call for aid in the Section work. He said his heart was with the members, as it always had been. He lived 3,000 miles away from Los Angeles, but he was going to be present at the next annual meeting—in fact he was going to follow the meetings as long as he lived.

Mr. Hays moved a vote of thanks to the Secretary and Historian for the excellent work done during the year, and the motion was carried unanimously.

There being no further business before the Section, on motion of Mr. Wilbert, it adjourned *sine die*.

ENTERTAINMENTS AT THE FIFTY-SEVENTH ANNUAL MEETING.

In addition to the many delightful surprises so bountifully provided by Dame Nature for all visitors, both en route to the place of meeting and at Los Angeles, the pharmacists of California had arranged a number of most enjoyable entertainments for the visiting members and their ladies. A very pleasant and rather unusual feature was the large gathering at the Hotel Alexandria on the Sunday preceding the meeting for the purpose of welcoming the visitors upon their arrival, which afforded an excellent opportunity for pleasant social intercourse. The thoughtfulness of the Ladies' Auxiliary in providing a basket of luscious California fruit in the room of each visiting member was characteristic of woman's care and attention, and was much appreciated by every one.

On Monday, August 16th, the Chamber of Commerce of Los Angeles tendered a reception to the members of the Association, and later in the evening the usual President's reception and dance was held at Blanchard Hall. Both were largely attended and much enjoyed, especially by the ladies; seasonable refreshments were served in abundance.

Special arrangements had been made for the entertainment of the visiting ladies, such as autumobile rides and a visit to the great fruit-packing establishment of Bishop & Co. on Tuesday, August 17th. Delegations from the Ladies' Auxiliary seemed to be constantly in attendance to assist the visitors in shopping tours, and on Wednesday afternoon the ladies were taken in trolley cars to Long Beach, where they were met later by their male relatives and friends, when all sat down to a sumptuous dinner, at the Hotel Virginia, provided by the local pharmacists. A more enjoyable occasion has rarely been offered than the few delightful hours spent at this beautiful resort on the shores of the great Pacific. The weather was ideal and every one in the best of spirits.

On Thursday, August 19th, the ladies were taken to Pasadena, one of the most beautiful towns in southern California, where they had an opportunity of viewing the many magnificent winter residences of wealthy Easterners. One of the most charming places to visit at Pasadena are the sunken gardens of Mr. A. Busch, of St. Louis. On the return trip a visit was paid to the Cawston Ostrich Farm, which proved very interesting. In the evening a large card party was given at the Hotel Alexandria for the ladies exclusively, and at the close of the session of the Section on Prac-

tical Pharmacy the gentlemen were royally entertained at Levy's Café by the Traveling Men's Auxiliary until long after midnight.

Mr. L. N. Brunswig, one of the leading members of the wholesale drug trade of California, tendered the visitors a garden party at his spacious home on Friday afternoon, which was largely attended; and in the evening a visit was paid by all not present at the Section sessions, to Venice, a nearby seaside resort, reminding one somewhat of Coney Island, N. Y.

The crowning event of the week came on Saturday, August 21st, after the close of the meeting, and consisted of a trip to Santa Catalina Island. After a very pleasant boat ride of about three hours this wonderful mecca of California fishermen was reached and an hour spent in viewing the submarine gardens in glass-bottom boats. To the visitors from the Middle West and the Eastern States this visit was indeed a revelation and a treat long to be remembered. Quite a number of the members remained on the island over Sunday to enjoy the unusual piscatorial sport offered at this place, and were well repaid for their efforts to land a fifty-pound yellowtail or a hundred-pound tuna. The honors of the catch were carried off by Messrs. Beal, Koch, Remington and Whelpley.

During the week following the meeting some of the members and their ladies visited the Yosemite Valley, San Francisco and Oakland, Cal., Portland, Ore., Seattle, Wash., and the Yellowstone Park, while others who had come to the meeting by way of these cities and natural wonders, remained at Los Angeles for several days, visiting Santa Barbara, Pasadena, Pomona, San Bernardino, Riverside, and other nearby points of interest, finally stopping at the Grand Canyon in Arizona and Albuquerque, New Mexico, on their homeward trip.

The trip to the Pacific coast and the meeting at Los Angeles offered rare surprises to the majority of the visiting members, and the wonders and beauties of our great Northwest and West made an impression not likely to be forgotten in a lifetime. In addition the bountiful hospitality of the local pharmacists was everywhere in evidence, and the people of California, Colorado, Oregon, Utah and Washington have become nearer and dearer to us all for the visit paid them.

APPENDIX.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES OR CERTIFICATES, FROM JULY 1, 1908, TO JULY 1, 1909.

	Annual Dues.	Certificates.
Abbett, Wm. A. ....'08	$5 00	
Abreu, Gerardo F. ....'08	5 00	
Ackerman, Philip J ....'09	5 00	
Adams, James H. ....'09	5 00	
Adams, James O ....'07-'08	10 00	
Ade, Daniel A....'08-'09	10 00	
Alacan, José P.... ....'08	5 00	$5 00
Alkire, Lewis L. ....'08	5 00	
Allen, Huestus B. ....'08	5 00	
Allison, Samuel P. ....'08	5 00	
Allison, William O.... ....'09	5 00	
Alpers, William C....'08	5 00	
Amos, W. S....'08	5 00	
Anderson, Carl G. ....'08	5 00	
Anderson, John C....'08	5 00	
Anderson, William C....'09	5 00	
Anderson, Samuel ....'07	5 00	
Andrews, Wm. A. P....'08	5 00	
Anewalt, Ellsworth Q....'07-'08	10 00	
Anglum, John ....'08	5 00	
Anspach, Paul B....'08-'09	10 00	
Apmeyer, Charles A ....'09	5 00	
Apple, Franklin M....'09	5 00	
Arneson, Thomas ....'08	5 00	
Arnold, William C.		3 00
Aschermann, Gustav S '06-'07-'08	15 00	
Aschman, F. T. ....'09	5 00	
Asher, Philip ....'08	5 00	
Atkins, Charles W ....'08	5 00	
Aughinbaugh, D. C. ....'08	5 00	
Avery, Charles H. ....'08	5 00	
Averyt, Henry M. ....'08	5 00	
Avis, James L ....'08-'09	10 00	
Axness, Ole M ....'07-'08-'09	15 00	
Ayres, Albert J. ....'09	5 00	
Ayres, Gold....'08	5 00	
Baas, George A. ....'08	5 00	
Bachman, Gustav. ....'09	5 00	
Bacon, Ephraim ....'08	5 00	
Baer, Edward A....'08-'09	10 00	
Baer, Jacob M....'09	5 00	
Baird, Julian W....'09	5 00	
Baker, De Forest....'08	5 00	
Baker, Edwin ....'09	5 00	
Baker, Walter N....'08	5 00	
Ball, Chas. E. ....'08	5 00	
Ballard, Charles W....'08	5 00	
Ballou, Clarence O. ....'09	5 00	
Balmert, Clemens A. ....'09	5 00	
Baltzly, Albert B....'08	5 00	
Bancroft, Richard B....'08	5 00	
Bandy, George....'08	5 00	
Bandy, Lewis A... ....'08-'09	10 00	
Bange, Otto F ....'08	5 00	
Bard, Wm. E. ....'09	5 00	
Barnard, Harry A....'08	5 00	
Barnes, Charles D ....'08	5 00	
Barnes, Henry C....'09	5 00	
Amount carried forward.....	$340 00	$8 00

	Annual Dues.	Certificates.
Amount brought forward	$340 00	$8 00
Barnett, Joel J ....'08-'09	10 00	
Bartlett, James E. ....'09	5 00	
Base, Daniel....'09	5 00	
Bate, Henry J ....'09	5 00	
Battles, Wilton L. ....'08	5 00	
Baughmann, Leo M. ....'08	5 00	
Baumann, Oscar ....'08	5 00	
Baur, Jacob ....'09	5 00	
Bayly, Charles A. ....'08	5 00	
Beal, George D. ....'08	5 00	
Bear, Pierce B. ....'09	5 00	
Bechberger, Henry....'08	5 00	
Beck, Julius E ....'07-'08	10 00	
Becker, Charles L. ....'08-'09	10 00	
Becker, Irwin A....'08	5 00	
Becker, Ulrich W. ....'09	5 00	
Bedard, George H....'08	5 00	
Behrens, Emil C. L. ... .'09	5 00	
Behrens, John F. ....'08-'09	10 00	
Beilstein, Christian....'08	5 00	
Beise, John H....'08-'09	10 00	
Beitenman, William W...'07-'08	10 00	
Bell, Emil R....'09	5 00	
Bell, John M. .... '08	5 00	
Bell, S. Howard....'08	5 00	
Bell, Wm. Ray....'07-'08	10 00	
Benedict, Philip V....'08	5 00	
Benfield, Charles W. ....'08	5 00	
Benfield, W. Edwin ....'09	5 00	
Bent, Edward C.... ... .'08	5 00	
Benton, Wilbur M. ....'08-'09	10 00	
Bentz, Henry G....'08	5 00	
Berger, Ernest....'08	5 00	
Berger, Louis ....'08-'09	10 00	
Bernstrom, Gustaf ....'08-'09	10 00	
Berryhill, Henry P....'08	5 00	
Best, Samuel M....'08	5 00	
Bethea, Oscar W....'08	5 00	
Bevens, John L. ....'08	5 00	
Bexten, Edward W.. ...'08-'09	10 00	
Beyschlag, Charles....'09	5 00	
Biehl, Lewis A....'08	5 00	
Bierman, Clarence H....'08	5 00	
Bieser, Charles L. ....'08	5 00	
Bigelow, Clarence O ....'08	5 00	
Bigelow, Chas. F....'08	5 00	
Bingham, Charles C. ....'08	5 00	
Biosca, Placido ....'08	5 00	
Blackmore, Henry S. ....'08-'09	10 00	
Bladen, John M....'08	5 00	
Blahnik, Marie (Mrs.) ....'09	5 00	
Blair, Henry C. ....'09	5 00	
Blakeslee, Louis G....'08	5 00	
Blanding, Wm. O. ....'09	5 00	
Blank, Herman G....'08	5 00	
Bletcher, Henry E. J. ...'08-'09	10 00	
Blodau, Robert P. ....'08	5 00	
Amount carried forward.....	$690 00	$8 00

	Annual Dues.	Certificates.
Amount brought forward.....	$690 00	$8 00
Blome, Walter H. .....'08	5 00	
Blumenschien, Fred J.....'08	5 00	
Boberg, Otto J. S.....'09	5 00	
Bodemann, Wilhelm.....'08	5 00	
Boediker, Otto .....'09	5 00	
Boehm, John J.....'08–'09	10 00	
Boerner, Emil L..... .....'08	5 00	
Bohlsen, Henry C.....'08	5 00	
Bohmansson, Robert H.....'09	5 00	
Bohn, George W.....'08	5 00	
Boldt, Fred W.....'09	5 00	
Bolenbaugh, Albert .....'09	5 00	
Bond, John B.....'09	5 00	
Bond, William C ....'09	5 00	
Booth, Albert E... .....'08	5 00	
Boulton, Emison A.....'08	5 00	
Bower, Edward A.....'08	5 00	
Bowman, Waldo M .....'09	5 00	
Boyken, John W.....'08	5 00	
Boynton, H.....'05–'06–'07–'08	20 00	
Boyson, G. H.....'08	5 00	
Boyson, John H..... .'08	5 00	
Brack, Charles E.....'09	5 00	
Bradbury, Wymond H...'08–'09	10 00	
Bradham, Caleb..'06–'07–'08–'09	20 00	
Bradley, Theodore J.....'09	5 00	
Bradshaw, Harry A.....'08	5 00	
Bradt, Warren L..... .'08	5 00	
Brandenberger, A...'06–'07–'08	15 00	
Braun, J. C.....'09	5 00	
Brecht, Frederick A.....'08	5 00	
Breedlove, W. H.....'09	5 00	
Brennan, James E.....'09	5 00	
Bresler, Simon L.....'08	5 00	
Breslin, Michael T.....'07	5 00	
Brennert, Aug.....'04	5 00	
Briggs, Andrew G..... .'07–'08	10 00	
Briggs, Armand E.....'08	5 00	
Brightwell, Newton E.....'08	5 00	
Brinker, John H.....'09	5 00	
Brinton, Clement S..... ....'08	5 00	
Brisley, Harry... .....'08	5 00	
Bromme, William L.....'08	5 00	
Brookes, Virginia C. (Miss)..'08	5 00	
Brown, Charles M...'06–'07–'08	15 00	
Brown, Edward P....'07–'08–'09	15 00	
Brown, George S.....'06	5 00	
Brown, J. Lee . .....'08	5 00	
Brown, Lewis W.....'08	5 00	3 00
Brown, W. A .....'09	5 00	
Browning, Ernest R.....'08	5 00	
Bruce, C. P.....'09	5 00	
Brucker, Carl.....'09	5 00	
Bruder, Otto E.....'06–'07	10 00	
Bruun, Harold N .....'08	5 00	
Bryson, William S.....'08	5 00	
Bucknam, Frank W.....'08–'09	10 00	
Buckner, John C.....'07	5 00	
Buntin, William C.....'07	5 00	
Burg, John D.....'08	5 00	
Burge, James O.....'08	5 00	
Burgheim, Jacob.....'07–'08	10 00	
Burke, William T.... .....'08	5 00	
Burnham, Alfred A., Jr.....'09	5 00	
Burnham, Ralph F.... .... '09	5 00	
Burvenich, Anton .....'09	5 00	
Burton, John C.....'07–'08	10 00	
Busch, Miers .....'09	5 00	
Butters, Chas. H.....'08–'09	10 00	
Cadmus, Robert C.....'08	5 00	
Calhoun, Will M.....'08	5 00	
Calkins, Eleazer E..... ....'08	5 00	
Call, Harry .....'09	5 00	
Campbell, Albert A..... '08	5 00	
Campbell, Charles B.....'08	5 00	
Amount carried forward.....	$1165 00	$11 00

	Annual Dues.	Certificates.
Amount brought forward.	$1165 00	$11 00
Campbell, Milton.....'09	5 00	
Campbell, Theodore .....'09	5 00	
Cantor, Lorentz. .....'09	5 00	
Capdau, Pierre A..... '09	5 00	
Carey, H. B..... .....'09	5 00	
Carpote, Jose.....'08–'09	10 00	
Cartaya, Julio H.....'08–'09	10 00	
Carter, Frank H ... ...'08–'09	10 00	
Carter, Frederick L.....'08–'09	10 00	
Carter, Harlen W..... '08–'09	10 00	
Caspari, Charles, Jr. .....'09	5 00	
Cassaday, O. U. .....'09	5 00	
Cassin, Elmer E ..... '08	5 00	
Castelhun, Karl. .....'08	5 00	
Cermak, Emil .....'08–'09	10 00	
Cheney, Arthur L..... .... '09	5 00	
Clapham, Hesser C.....'08	5 00	
Clapp, Lowell T.....'08–'09	10 00	
Claren, Geo. V..... .... '09	5 00	
Clark, Albert H. ....'08	5 00	
Clark, Alfred W. .....'08–'09	10 00	
Clark, Mallie A. .....'08	5 00	
Clark, Charles J.....'08	5 00	
Claus, Otto F. .....'08	5 00	
Clayton, Abraham T.....'08	5 00	
Clayton, Charles J.....'09	5 00	
Cliffe, Wm. L. .....'08	5 00	
Cline, Raoul R. D.....'08	5 00	
Clothier, C. Roland.....'09	5 00	
Clough, Frank H.....'09	5 00	
Coblentz, Virgil. .....'08	5 00	
Coffee, Sidney J..... ...'09	5 00	
Coffman, Walter T.....'06	5 00	
Cohn, Alfred I.....'08	5 00	
Cole, Victor L..... .....'08	5 00	
Coleman, Glenn F....'00–'10–'11	15 00	
Coleman, John.....'09	5 00	
Coleman, John H. .....'09	5 00	
Collins, Albert B.....'08	5 00	
Collins, Frank A.....'07–'08	10 00	
Comfort, Newton C.....'08	5 00	
Congdon, George G.....'08	5 00	
Conger, Frederick A.....'09	5 00	
Connelly, Fred W. .....'08	5 00	
Conover, Samuel H. .....'08	5 00	
Conyngham, Wm. B.....'09	5 00	
Conzet, Rufus W.....'09	5 00	
Cooban, Benjamin S.....'09	5 00	
Cook, Alfred P.....'08	5 00	
Cook, E. Fullerton.....'09	5 00	
Cook, James O.....'08	5 00	
Cook, Thomas P.....'09	5 00	
Coonley, Charles.....'09	5 00	
Coons, William I .....'08	5 00	
Cooper, J. W.... .....'09	5 00	
Cope, Frank H... .....'09	5 00	
Cornell, Edward A.....'08	5 00	
Cotton, Robert M. .....'08	5 00	
Coughlin, John.....'08–'09	10 00	
Coulson, James T.....'08–'09	10 00	
Cousins, Walter ....'09	5 00	
Covey, John W.....'08–'09	10 00	
Craig, Hugh.. .....'08	5 00	
Craw, Eugene E.....'08	5 00	
Crawshaw, Herbert H. .....'08	5 00	
Creighton, Mary L. (Miss)..'09	5 00	
Criswell, Francis M. ..... '08	5 00	
Cross, Elias H.....'09	5 00	
Crowdle, John E.....'06–'07	10 00	
Crowley, James P. .....'08	5 00	
Culley, John .....'08	5 00	
Curd, Thomas N.....'08–'09	10 00	
Curquejo, Antonio G.....'08	5 00	
Curry, Gordon L....'06–'07–'08	15 00	
Cuthbert, Richard W.....'09	5 00	
Amount carried forward.....	$1630 00	$11 00

	Annual Dues.	Certificates.
Amount brought forward.....	$1630 00	$11 00
Daboll, Horace H. .....'08	$5 00	
Daggett, V. Chapin .....'09	5 00	
Dahlin, Horace O. .....'07-'08	10 00	
Daneker, Howard N.....'08	5 00	
Dare, Charles F.....'08	5 00	
D'Artenay, Eugene ....'08	5 00	
Davies, Llewellyn P. '06-'07-'08	15 00	
Davis, Charles Howard.....'08	5 00	
Davis, Charles L.....'09	5 00	
Davis, Daniel F.....'08	5 00	
Davis, Emma M .. ..'08	5 00	
Davis, Eugene M. .....'08	5 00	
Davis, John A.....'06	5 00	
Dawson, Edward S., Jr ..'08-'09	10 00	
Dawson, John H.....'08	5 00	
Day, William B. .....'08-'09	10 00	
Dayton, Walter H .....'08	5 00	
De Barr, Edwin .....'07-'08	10 00	
De Jonge, Cornelius .....'08	5 00	
De Lorenzi, Albert .....'08	5 00	
Deakyne, Harry H. ....'09	5 00	
Dean, August H..... ..'08-'09	10 00	
Dean, H. G. ....'08	5 00	
Dedman, Richard .....'08	5 00	
Deck, Lewis C.....'09	5 00	
Decker, W. Robert..... '08	5 00	
Deibert, Thomas I.....'09	5 00	
Depeyre, Louis N. .....'08	5 00	
Deuel, C. Fred.....'09	5 00	
Dewender, Wm. H. .....'09	5 00	
Diaz, José A.....'09	5 00	
Dickson, Fred W. .....'08	5 00	
Dieden, Frank X.....'06	5 00	
Diehl, August.....'09	5 00	
Diekman, George C. .....'09	5 00	
Diggs, Lowell C.....'08	5 00	
Dimond, Harry J. .....'09	5 00	
Diner, Jacob.....'08	5 00	
Dinkler, Frank A. .....'09	5 00	
Dinsmore, Warren ..... .'08	5 00	
Dissosway, Thurston N..... '08	5 00	
Dittmeyer, Walter E..... '09	5 00	
Dixon, J. Marion .....'09	5 00	
Dodd, W. F.....'09	5 00	
Dodds, Richard N.....'08	5 00	
Doherty, William H.....'08	5 00	
Dohme, Alfred R. L.....'09	5 00	
Donahue, Henry M. .....'08	5 00	
Dort, Edward H .....'09	5 00	
Douglas, Austin E .....'08	5 00	
Dow, C. A. ....'09	5 00	
Dow, John P.....'07-'08	10 00	
Dowdy, Joseph F .....'08	5 00	
Downing, Benjamin F., Jr. ..'09	5 00	
Drackett, Philip W.....'08	5 00	
Dresser, George E. ..'05-'06-'07	15 00	
Drossel, August A .....'08	5 00	
Drucker, August E. .....'08	5 00	
Druehl, Frank A .....'08-'09	10 00	
DuBois, William L.....'08-'09	10 00	
Dubrule, Rasaire.....'09	5 00	
Duering, Henry C. .....'07-'08	10 00	
Dulaney, Joseph F.....'08	5 00	
Dunning, H. A. B.....'09	5 00	
Dunning, Lyman T. ....'07-'08	10 00	
Duntze, Francis C., Jr.....'08	5 00	
Dutt, William .....'08-'09	10 00	
Dvorak, Joseph T. .....'08	5 00	
Dye, Clair A. .....'09	5 00	
Easterday, Herbert C....'08-'09	10 00	
Eaton, Harry E. .....'09	5 00	
Eberhardt, Ernest G.....'08	5 00	
Eberle, Arthur R. .....'09	5 00	
Eberle, Eugene G. .....'09	5 00	
Eberle, Herman T.....'09	5 00	
Amount carried forward.....	$2085 00	$11 00

	Annual Dues.	Certificates.
Amount brought forward.....	$2085 00	$11 00
Eccles, Robert G..... .....'09	5 00	
Eckert, John.....'08	5 00	
Eckler, Charles R.....'08	5 00	
Eckstein, Andrew J. .....'08	5 00	
Eddy, Wynn L. .....'08	5 00	
Ehrlicher, Henry M. ....'07-'08	10 00	
Eiben, J. J. .....'09	5 00	
Eichold, Bernard H. .....'08	5 00	
Eichrodt, Mary E. (Mrs.)...'08	5 00	
Eisele, George .....'08	5 00	
Eisele, Martin A ....'09	5 00	
Elam, John T. .....'08-'09	10 00	
Eldred, Frank R. .....'08-'09	10 00	
Elfstrand, Wilhelm.....'08	5 00	
Elgin, Lewis L.....'08	5 00	
Ehel, Leo .....'09	5 00	
Elkin, William S .....'07-'08	10 00	
Ely, Ernest S. ....'09	5 00	
Emanuel, Julia E. (Miss) ...'09	5 00	
Engelhard, George P. '06-'07-'08	15 00	
Engelhardt, Hermann .....'08	5 00	
England, Joseph W. ....'08-'09	10 00	
English, William M. .....'08	5 00	
Engstrom, Ernest O. ....'08-'09	10 00	
Ennis, Ephraim L. .....'09	5 00	
Erhart, William H.....'08-'09	10 00	
Eschmann, Clemens L. .....'08	5 00	
Estabrook, Henry A.....'08-'09	10 00	
Evans, Arthur S. ... .'09	5 00	
Evans, George B.....'09	5 00	
Evans, Harry O. N. ..... .'08	5 00	
Evans, Wm. J. .....'08	5 00	
Eysenbach, Henry P ....'07-'08	10 00	
Fahrner, Alphonse A. ...'07-'08	10 00	
Fairchild, Benjamin T.....'09	5 00	
Fairchild, Samuel W ..... .'09	5 00	
Falk, John C.....'08 '09	10 00	
Fanous, Amin.....'08	5 00	
Fantus, Bernard .....'09	5 00	
Faxon, Henry D. .....'09	5 00	
Federmann, Wm. M. ....'08-'09	10 00	
Feick, Charles ... .'08	5 00	
Feil, Joseph .....'08	5 00	
Fein, Marry A. (Miss) .....'08	15 00	
Feindt, Louis E. ....'07-'08-'09	5 00	
Feldkamp, Charles L.....'08	10 00	
Fennel, Charles T. P ....'07-'08	5 00	
Ferger, Edward .....'08	5 00	
Ferguson, George A.....'08	5 00	
Fickardt, Fred L. .....'08	5 00	
Fieber, Gustav A. .....'08	5 00	
Finch, Charles S .....'08	5 00	
Fink, Daniel J. ....'09	10 00	
Finneran, James F.....'08 '09	5 00	
Finney, Burt..... ...'09	5 00	
Finninger, Paul E. .....'08	5 00	
Fischer, Henry .....'08	5 00	
Fischer, Henry J..... .....'09	10 00	
Fischer, Richard .....'08-'09	10 00	
Fischnar, John F. .....'07-'08	5 00	
Fisher, George W. ... .'09	10 00	
Fitzpatrick, Patrick J....'08-'09	10 00	
Flenier, Lewis..... .....'08 '09	5 00	
Fletcher, David M .....'09	5 00	
Flood, D. A.....'09	5 00	
Fogas, Wm. H. .....'08	5 00	
Forbes, J. Winchell .....'08	5 00	
Forbrich, Joseph F.....'08	5 00	
Ford, Charles M .....'09	5 00	
Forrest, John J. .. ..'09	5 00	
Foster, Frank H .....'08	5 00	
Fouch, Wm. M. .....'09	5 00	
Foulke, James .....'09	5 00	
Fox, Willard M. .....'08	5 00	
Frailey, William O..... .'09	5 00	
Amount carried forward.....	$2570 00	$11 00

	Annual Dues.	Certificates.
Amount brought forward.	$2570 00	$11 00
Frames, J. Fuller.....'08	5 00	
Francis, J. Richard.....'07–'08	10 00	
Francis, John M..... '08	5 00	
Franzoni, Joseph D.....'08–'09	10 00	
Frauenhoff, F. L.....'09	5 00	
Frauer, Herman E.....'08–'09	10 00	
Freeman, James J.....'09	5 00	
French, Harry B.....'09	5 00	
French, Howard B.....'09	5 00	
Fricke, Frederick G. .....'09	10 00	
Fricke, Frederick H. ....'08–'09	5 00	
Friedenburg, M. W. .....'09	5 00	
Frost, William A..... .....'09	5 00	
Fry, Herman. .....'09	5 00	
Fry, Narcys G.....'09	5 00	
Frye, Geo. C .....'09	5 00	
Gabell, Cromwell P. .....'08	5 00	
Gable, Ralph B. .....'08	5 00	
Gaddess, John.	.....	3 00
Gaddess, Thomas	.....	3 00
Gahn, Henry ....'08	5 00	
Gallagher, John C.....'09	5 00	
Gallenkamp, Edward W. ....'08	5 00	
Galvin, Mathew .....'09	5 00	
Gamble, Stewart .....'09	5 00	
Gammon, Irving P..... ...'08	5 00	
Gane, Eustace H.....'08–'09	10 00	
Gano, William H..... ..'08–'09	10 00	
Gansz, William H. .....'09	5 00	
Garber, Elmer F. W.....'09	5 00	
Garrett, Oscar N.....'08	5 00	
Garvin, Patrick J.....'06–'07–'08	15 00	
Gaus, Charles H.....'09	5 00	
Gayle, John W.....'09	5 00	
Geisler, Joseph F.....'08–'09	10 00	
George, Charles T .....'08	5 00	
Gertler, John H.....'08	5 00	
Gibson, Frank L.....'09	5 00	
Gibson, John S. .....'08	5 00	
Gietner, Charles..... .....'08	5 00	
Gilman, Elbridge W.....'09	5 00	
Gilpin, Henry B.....'09	5 00	
Glass, William F.....'08	5 00	
Gleason, Patrick S.....'08	5 00	
Glogan, Alex.....'08	5 00	
Glover, William H..... '08	5 00	
Godbold, Fabius C.....'08–'09	10 00	
Godding, John G.....'09	5 00	
Goeckel, Henry J. .....'08	5 00	
Goetting, Ernest C.....'09	5 00	
Goldberg, Joseph.....'08	5 00	
Goldsborough, Charles H....'08	5 00	
Goodman, Frank S.....'08	5 00	
Goodman, Laura.....'08	5 00	
Goodykoontz, C. H..... ...'09	5 00	
Gordin, Harry M..... ...'09	5 00	
Gorenflo, Oscar Wm.....'09	5 00	
Gorgas, George A. .....'09	5 00	
Goss, Chas.....'08	5 00	
Grace, William D. .....'08	5 00	
Graham, Willard..... ..... '08	5 00	
Gray, Margaret McC. (Mrs.)'09	5 00	
Gray, William ..... '08–'09	10 00	
Green, Arthur L.....'09	5 00	
Green, Benjamin.....'09	5 00	
Green, Carl V.....'08	5 00	
Green, Edward T.....'08	5 00	
Green, Franklin T.....'08	5 00	
Green, Robert L.....'08	5 00	
Greene, William R .....'07	5 00	
Gregorious, Wm. P.....'08	5 00	
Gregory, Willis G.....'07–'08	10 00	
Greule, Albert M.....'08–'09	10 00	
Grewe, Louis F. ....'08	5 00	
Greyer, Julius ....'09	5 00	
Amount carried forward.....	$3000 00	$17 00

	Annual Dues.	Certificates.
Amount brought forward.	$3000 00	$17 00
Griffin, Lyman W. . .....'09	5 00	
Griffith, Charles. .....'08	5 00	
Griffith, J. Arthur. .....'08	5 00	
Gross, Charles E.....'08–'09	10 00	
Gross, William O..... .....'08	5 00	
Grover, Robert O. .....'08	5 00	
Groves, Henry C..... .....'08	5 00	
Gruen, J. George .....'08	5 00	
Guehring, John, Jr.....'08	5 00	
Guerin, James F.....'08	5 00	
Guerrero, Leon M.'06–'07–'08–'09	20 00	
Guidry, Ambrose J.....'08	5 00	
Gundrum, George. .....'08–'09	10 00	
Guy, George O..... .....'08	5 00	
Haddad, Saleem F..... '08	5 00	
Hagenow, Theodore F...'08–'09	10 00	
Hahn, Charles W. J. H.....'08	5 00	
Hahn, Philip A.....'08	5 00	
Hain, Frank W. A. .... '08–'09	10 00	
Haines, William F.... .....'08	5 00	
Hall, Frank M.....'08	5 00	
Hall, Joseph P.....'08	5 00	
Hall, William A.....'08	5 00	
Hallaway, Robert R..... ...'08	5 00	
Hallberg, Carl S. N. .....'08	5 00	
Halliday, Thomas L.....'08	5 00	
Halliburton, Orlando..... ..'08	5 00	
Halstead, Alice L. (Mrs.)....'09	5 00	
Hamann, William A. ....'09	5 00	
Hamil, Wm. E.....'08	5 00	
Hamilton, Carl.....'08	5 00	
Hammar, Alrick ....'09	5 00	
Hamner, E. C.....'09	5 00	
Hamner, James F. .....'08	5 00	
Hancock, James E.....'08–'09	10 00	
Hancock, N. F..... '09	5 00	
Hankey, William T. .....'09	5 00	
Harbaugh, Wilson L.....'08–'09	10 00	
Harbold, Curtis A.....'08	5 00	
Harbord, K. (Miss)'06–'07–'08–'09	20 00	
Hardin, John H.....'08	5 00	
Harms, Herman.....'08–'09	10 00	
Harper, Charles B.....'08	5 00	
Harrington, V. M. .....'09	5 00	
Harrison, William H.....'06	5 00	
Harter, Isaac F. ....'08	5 00	
Hartigan, Joseph D. .....'08	5 00	
Hartwig, Otto J .....'08	5 00	
Hartz, J. D. August.....'09	5 00	
Harvey, C. J.....'08	5 00	
Haschenburger, Edmund O..'09	5 00	
Hassinger, Samuel E. R.....'09	5 00	
Hatcher, Robert A. .....'09	5 00	
Hatton, Ellmore W.....'09	5 00	
Hauber, Peter P. .....'07–'08	10 00	
Hauenstein, William .....'08	5 00	
Haussman, Frederick W.....'08	5 00	
Havenhill, L. D.....'09	5 00	
Hawthorne, H. F.....'09	5 00	
Haydock, S. G. (Miss)...'08–'09	10 00	
Hayes, Horace P..... .....'08	5 00	
Haymaker, Frank B.....'08	5 00	
Haynes, Herbert.....'08–'09	10 00	
Hays, Francis B.....'09	5 00	
Headen, C. T..... .. '09	5 00	
Hebberd, Edward S. .....'08	5 00	
Hedegard, H. C.....'09	5 00	
Hedquist, Alex.....'08	5 00	
Hedquist, Francis J. .....'08	5 00	
Heebner, Charles F.....'08	5 00	
Heidbreder, Albert H.... ...'08	5 00	
Heim, William J.....'09	5 00	
Heinitsh, Sigmund W.....'08	5 00	
Heinritz, Herman.....'09	5 00	
Heinritz, Lebrecht G. .....'09	5 00	
Amount carried forward.....	$3455 00	$17 00

	Annual Dues.	Certificates.
Amount brought forward.....	$3455 00	$17 00
Helfman, Joseph.....'08-'09	10 00	
Heller, Charles T.....'08	5 00	
Hellmuth, Joseph A..... ...'09	5 00	
Hellstern, Edward.....'08-'09	10 00	
Hemm, Francis.....'08	5 00	
Hengst, J. Edwin.....'08	5 00	
Henkel, Alice (Miss).....'08	5 00	
Henkel, Charles B.....'08	5 00	
Henriques, Adolph.....'09	5 00	
Henry, Frank C.....'08	5 00	
Henry, Samuel C.....'09	5 00	
Hepburn, John.....'08	5 00	
Herbst, William P.....'08	5 00	
Hereth, Frank S.....'09	5 00	
Hermanek, Joseph C.....'09	5 00	
Herpich, John L.....'09	5 00	
Hess, Nicholas A. ....'08	5 00	
Hess, Paul L.....'08	5 00	
Heuisler, Philip L.....'08-'09	10 00	
Highfield, Herbert M. .....'08	5 00	
Hill, Aubrey T.....'08	5 00	
Hill, Warren B.....'08	5 00	
Hilpert, Willis S.....'08-'09	10 00	
Hilton, Samuel L. .....'08-'09	10 00	
Hindle, William P.....'08-'09	10 00	
Hiss, A. Emil.....'09	5 00	
Hitchcock, George H. .....'08	5 00	
Hoburg, Wm. A., Jr.....'09	5 00	
Hodson, Eugene W. .....'08	5 00	
Hoechstetter, Max S.....'08	5 00	
Hoffmann, George F.....'08	5 00	
Hoffmann, George L.....'08	5 00	
Hoffmann, George W. .....'08	5 00	
Hogaboom, George A. .....'08	5 00	
Holliday, Francis E.....'09	5 00	
Holloway, Jesse D.....'08	5 00	
Holm, Marinus L.....'09	5 00	
Holmes, Henry E.....'09	5 00	
Holsopple, J. Bert.....'08	5 00	
Holt, Edwin M. .....'08-'09	10 00	
Holverson, Henry T.....'09	5 00	
Holzhauer, Charles W. .....'09	5 00	
Hook, James P. ....'09	5 00	
Hoover, George W.....'08	5 00	
Hope, Robert L.....'08	5 00	
Hopkins, Jesse L. .....'09	5 00	
Hopp, Lewis C. .....'08	5 00	
Horlick, Alex. J.....'09	5 00	
Horn, Wilbur F..... .....'08	5 00	
Horne, Warren W.....'08	5 00	
Houck, D. L. .....'09	5 00	
Houghton, E. Mark .....'08	5 00	
Hover, William A.....'09	5 00	
Howard, Fletcher (Mrs.)....'08	5 00	
Howard, Henry..... .....'08	5 00	
Howell, Edward V. .....'08	5 00	
Howson, Arthur B. .....'09	5 00	
Hubbard, Fred A. ....'09	5 00	
Huber, Joseph A. .....'08	5 00	
Huder, Henry J.....'09	5 00	
Hudnut, Richard A. ...'08-'09	10 00	
Huested, Alfred B.. .....'08	5 00	
Hughes, Francis S.....'09	5 00	
Huhn, Charles H. .....'08	5 00	
Humphreys, Charles J.....'08	5 00	
Hunt, Reid .....'08	5 00	
Hunter, Angus .....'09	5 00	
Huntley, Clyde G.....'09	5 00	
Hurd, John C.....'09	5 00	
Hurlebaus, George W. .....'08	5 00	
Hurley, Horace O.....'09	5 00	
Hurley, John .....'09	5 00	
Hurty, John N.....'08-'09	10 00	
Huston, Thos. B..... .....'08	5 00	
Hyde, Baron M.....'08	5 00	
Amount carried forward.....	$3875 00	$17 00

	Annual Dues.	Certificates.
Amount brought forward.....	$3875 00	$17 00
Hynson, Henry P.....'09	5 00	
Ilhardt, William K. . .....'08	5 00	
Iltis, George W. .....'09	5 00	
Impey, W. F. .....'09	5 00	
Ink, Charles E. .....'08	5 00	
Irvine, Darwin W....'05-'06-'07	15 00	
Isakovics, Alois von..... '09	5 00	
Ittner, Wm. F ....'08	5 00	
Jackman, Wilbur F. .....'c8	5 00	
Jacobs, Charles C. .....'07-'08	10 00	
Jamieson, George A. .....'08	5 00	
Jeffrey, Frank D. ....'09	5 00	
Joergensen, Sophus .....'07-'08	10 00	
Johnson, Charles W. .....'09	5 00	
Johnson, J. C. .....'09	5 00	
Johnson, Joy H. .....'08-'09	10 00	
Johnson, Manuel .....'08-'09	10 00	
Johnson, Ralph H.....'07	5 00	
Johnson, Thur W. .....'08	5 00	
Jones, David F. .....'08	5 00	
Jones, Harold W. .....'09	5 00	
Jones, M. A .....'09	5 00	
Jones, Oscar W. .....'08-'09	10 00	
Jones, Thomas W. .....'08	5 00	
Jordan, Chas. B.....'09	5 00	
Jorden, Henry A .....'08-'09	10 00	
Jorgenson, Edward B. ...'07-'08	10 00	
Josenhans, Reinhardt C. J. ..'08	5 00	
Judd, Albert F. . .....'08	5 00	
Judge, Charles R. .....'08	5 00	
Jungk, Walter A. . ..... '08	5 00	
Jungmann, Julius .....'08-'09	10 00	
Juster, Hermann .....'08	5 00	
Kaemmerer, Wm. F. .....'09	5 00	
Kahn, Julius H. . ...'06-'07-'08	15 00	
Kahn, Solomon K. .....'08	5 00	
Kalish, Oscar G. .....'08-'09	10 00	
Kalusowski, Henry E. ..'08-'09	10 00	
Kantrowitz, Hugo.....'08	5 00	
Kassulke, August .....'08	5 00	
Katz, Otto.....'08	5 00	
Kauffman, Emmett C. .....'08	5 00	
Kauffman, George B .....'09	5 00	
Kearfott. C. P. ..... '08-'09	10 00	
Kebler, Lyman F. .....'08	5 00	
Keenan, Thomas J. .....'07-'08	10 00	
Keith, Irwin A. .....'07-'08-'09	15 00	
Keller, Charles F., Jr. .....'08	5 00	
Keller, William O. E. .....'08	5 00	
Kelly, E. Frank.....'08	5 00	
Kemp, Edward.. .....'09	5 00	
Kent, Henry A. ....'08	5 00	
Kercher, Edwin H. .....'09	5 00	
Kiedaisch, George A.....'08	5 00	
Kiler, Abdel .....'08	5 00	
Kimberly, Chas. H.....'09	5 00	
King, George A. N. .....'08	5 00	
Kirchgasser, William C.....'09	5 00	
Kirchgessner, William C.....'08	5 00	
Kirk, Frank H.....'08	5 00	
Kirk, James E.....'08-'09	10 00	
Kirk, Samuel B. .....'08	5 00	
Kirkland, Derwentwater. '08-'09	10 00	
Kisker, Frederick W.....'08	5 00	
Kistner, Otto .....'08	5 00	
Klein, Edward N. E. .....'09	5 00	
Klein, Ernest F. .....'09	5 00	
Kleine, Oscar C., Jr. ....'08-'09	10 00	
Kleinschmidt, A. A..... ....'08	5 00	
Klenze, William T. .....'08-'09	10 00	
Klie, G. H. Charles. .....'08	5 00	
Kliemand, George .....'08	5 00	5 00
Kline, Clarence M.....'09	5 00	
Kline, Mahlon N..... ...'09	5 00	
Klore, William W. .....'08	5 00	
Amount carried forward.....	$4360 00	$22 00

	Annual Dues.	Certificates.
Amount brought forward.	$4360 00	$22 00
Knabe, Gustavus A .....'08	5 00	
Knight, F. H..... .....'09	5 00	
Kniseley, Elmer L.....'09	5 00	
Kniseley, J. R..... ..'09	5 00	
Knoebel, Percy T. .....'09	5 00	
Knoebel, Thomas .....'09	5 00	
Knoefel, Bruno ....'08	5 00	
Knoefel, Charles D...'07-'08-'09	15 00	
Knox, Stephen D .....'08	5 00	
Koch, August F..... .....'09	5 00	
Koch, Fred C. .....'09	5 00	
Koch, William J.....'09	5 00	
Koegel, Herman H.....'08	5 00	
Koelle, Otto C.....'08	5 00	
Kolsch, Julius. ..... '08-'09	10 00	
Koss, Frank .....'08	5 00	
Kossler, Herman S...'06-'07-'08	15 00	
Kradwell, Gastav V. .....'08	5 00	
Kramer, Wilhelm. .....'08-'09	10 00	
Kraus, Otto ....'09	5 00	
Krause, John .....'07-'08	10 00	
Kreizinger, Karl L..... ....'09	5 00	
Krembs, Ernest M..... ....'09	5 00	
Kress, Horace.		5 00
Krieger, John C.....'08	5 00	
Kronberger, Israel B.. .....'08	5 00	
Krul, John G. .....'08	5 00	
Krvavica, Antony .....'08-'09	10 00	3 00
Kuder, William F. .....'08	5 00	
Kuehne, Charles.....'07-'08	10 00	
Kutchbauch, John F.....'09	5 00	
Kutscher, George W.....'07-'08	10 00	
LaPierre, Elie H.....'09	5 00	
LaWall, Charles H.....'09	5 00	
LaWall, Millicent R. (Mrs.).'09	5 00	
Lackey, Richard H.....'09	5 00	
Ladish, Erich H.....'09	5 00	
Lalor, James H.....'09	5 00	
Lamm, Edward L... ....'08-'09	10 00	
Lampa, Robert R.....'08-'09	10 00	
Land, Robert H., Jr. ....'08-'09	10 00	
Langenhan, H. Aug.....'08	5 00	
Lantz, Wm. H.....'09	5 00	
Larsen, Lars P.....'09	5 00	
Larson, Martin. .....'08-'09	20 00	
Lascoff, J. Leon.....'08	5 00	
Latham, Thomas.....'08-'09	10 00	
Laue, John M. A.....'09	5 00	
Lauer, Emanuel H.....'09	5 00	
LeRicheux, Alfred C.....'08	5 00	
Leavitt, Adoniram J.....'09	5 00	
Lee, Richard H. .....'08	5 00	
Lee, William E. .....'09	5 00	
Leeb, Theodore F. .....'08	5 00	
Leedom, Charles .....'08	5 00	
Leet, Robert A..... .....'08	5 00	
Legel, John G.....'08	5 00	
Legendre, Joseph A.....'07-'08	10 00	
Lehman, Chas. N.....'09	5 00	
Lehman, C. Walter .....'08-'09	10 00	
Lehr, Philip .....'08	5 00	
Leisenring, Willis. ....'09	5 00	
Lemasters, William O. .....'09	5 00	
Leonard, Edwin T..... ...'09	5 00	
Leverty, John A..... .....'08	5 00	
Levier, Oscar H.....'08	5 00	
Levy, William M.....'08	5 00	
Lewis, Ernest G.....'09	5 00	
Lewis, G. R.....'09	5 00	
Lewis, Henry .....'08-'09	10 00	
Lichthardt, George H. P.....'08	5 00	
Lide, Leslie.....'09	5 00	
Lilly, Eli .....'08-'09	10 00	
Lilly, Josiah K. ....'08-'09	10 00	
Lindley, Ira W.....'08	5 00	
Amount carried forward.....	$4840 00	$30 00

	Annual Dues.	Certificates.
Amount brought forward.	$4840 00	$30 00
Lindly, John M. .....'08	5 00	
Lindvall, Gus. .....'09	5 00	
Llewellyn, Frederick W.....'08	5 00	
Loehr, Theodore C...'06-'07-'08	15 00	
Loertz, Carl E..... 08	5 00	
Lohmann, Herman J.'07-'08-'09	15 00	
Lohmann, John. .....'09	5 00	
Long, John N. G.....'08	5 00	
Lough, Thomas W.....'07-'08	10 00	
Lousararian, Armenag .....'08	5 00	
Lovis, Henry C.....'08-'09	10 00	
Lowe, Charles H.....'08	5 00	
Lowe, Clement B.....'07-'08	10 00	
Lowell, Edward M.....'09	5 00	
Lucas, Geo. R .....'09	5 00	
Ludwig, Wm. E.....'09	5 00	
Lueder, Fritz..... .....'08-'09	10 00	
Lyford, Earl H.....'08	5 00	
Lyman, Rufus A.....'08-'09	10 00	
Lynn, Charles J. .....'08-'09	10 00	
Lyon, Arthur G.....'09	5 00	
Maas, Arthur R..... .....'09	5 00	
MacDowell, Wm. F.....'08-'09	10 00	
MacMillin, Edw. W. .....'09	5 00	
Macy, Sherman R....'06-'07-'08	15 00	
Madden, St. Clair. ....'09	5 00	
Maggio, James L.....'08-'09	10 00	
Maisch, Henry.....'08	5 00	
Maisel, Joseph. .....'08	5 00	3 00
Major, John R. .....'08	5 00	
Mallard, Albert E. .....'08	5 00	
Mandelbaum, M. R.....'09	5 00	
Mankin, Geo. T.....'09	5 00	
Mansfield, Samuel.....'08	5 00	
Mares, Ferdinand L. .....'08	5 00	
Marquier, Adolph F. .....'09	5 00	5 00
Marr, William G. .....'08	5 00	
Martin, F. H..... .....'09	5 00	
Martin, Harry ..... '09	5 00	
Martin, J. A.....'09	5 00	
Martin, James H.....'08	5 00	
Martin, Nicholas H. .....'09	5 00	
Martin, William R .....'08	5 00	
Martinez, Alfred.....'08 '09	10 00	
Mason, Harry B.....'08	5 00	
Mason, Myron R.....'09	5 00	
Master, Walter.....'09	5 00	
Matthews, Charles E.....'09	5 00	
Matusow, Harry .....'09	5 00	
May, Charles C. ....'08	5 00	
May, Louis. .....'08	5 00	
Mayer, Joseph L.....'09	5 00	
Mayer, Peter.....'09	5 00	
Mayo, Caswell A.... ....'07-'08	10 00	
McAdams, William J.....'08	5 00	
McBride, Chas R.....'08	5 00	
McCartney, Frank L.....'08	5 00	
McCartney, Frank S.....'08	5 00	
McCauley, Charles E.....'08	5 00	
McClugage, John J.....'08	5 00	
McClure, Clarence M.....'08	5 00	
McConaughy, Thomas S.....'09	5 00	
McConnell, Chas. H.... ....'09	5 00	
McConnell, Lewis W.....'09	5 00	
McCrea, Harry F.....'08	5 00	
McDaniel, J. Preuit. .....'08	5 00	
McDonnell, H. L. .....'08	5 00	
McFerren, J. D. .....'08	5 00	
McGill, John T.....'09	5 00	
McGinniss, E. K .....'08	5 00	
McGovern, John F.....'07-'08	10 00	
McKay, Felix E. .....'08-'09	10 00	
McKellips, Clarence .....'09	5 00	
McKenzie, Robert H. .....'08	5 00	
McKesson, Donald .....'09	5 00	
Amount carried forward.....	$5305 00	$38 00

	Annual Dues.	Certificates.
Amount brought forward.....	$5305 00	$38 00
McKesson, G. Clinton.....'08	5 00	
McKinney, Robert S. '07-'08-'09	15 00	
McKown, Joseph O. ....'07-'08	10 00	
McMahon, Joseph ....'08	5 00	
McMahon, Stonewall J. ....'08	5 00	
McNeil, Robert .....'08	5 00	
McNess, Frederick.....'08	5 00	
McQuillen, Francis.....'08	5 00	
Meeker, George H.....'08-'09	10 00	
Mehl, Henry W. .....'06	5 00	
Meissner, Frederick, Jr. ....'09	5 00	
Menk, Charles W. .....'09	5 00	
Merrell, Charles G. .....'08-09	10 00	
Merrell, George R.....'09	5 00	
Merrell, Hubert S.....'08	5 00	
Mertz, Edward L. .....'08	5 00	
Meserve, Albert W. .. ..'08	5 00	
Metz, Abraham L. ..... '08	5 00	
Metzger, Arthur S.....'08	5 00	
Meyer, Adolph C. .....'09	5 00	
Meyer, Martin M. ....'08	5 00	
Meyer, Frederick H.....'08	5 00	
Meyer, Theodore F. ... ... '09	5 00	
Meyer, Walter F. .....'08	5 00	
Michaelis, Gustavus ....'08-'09	5 00	
Mierzwa, Richard .....'08	5 00	
Mikkelsen, Niels ....'06-'07-'08	15 00	
Millener, William S. .....'08	5 00	
Miller, Albert .....'08	5 00	
Miller, Charles.....'08	5 00	
Miller, Emerson R. .....'08	5 00	
Miller, Frederick J. .....'08	5 00	
Miller, F. William .....'08	5 00	
Miller, Roshier W.....'07	5 00	
Miller, T. Ashby .....'08	5 00	
Milligan, John D. .....'07-'08	10 00	
Mills, George P. .....'08	5 00	
Minehart, John R. .....'07-'08	10 00	
Miner, Maurice A... .....'08	5 00	
Minesinger, Norman W. ....'08	5 00	
Minton, Charles N. ....'08	5 00	
Mitermiler, John A. .....'08	5 00	
Mittelbach, William.....'09	5 00	
Moerk, Frank X. ....'09	5 00	
Mohler, David C. .....'08	5 00	
Moore, John T. ....'09	5 00	
Moore, Thomas H.....'09	5 00	
Morales, C. Garcia .....'08	5 00	
Morgan, Charles.....'06-'07-'08	15 00	
Morgan, Frank E. ..... '09	5 00	
Morgan, Thomas L.....'08	5 00	
Morin, Ludger J. ....'08	5 00	
Morris, George A. .....'08	5 00	
Morris, Max ... .'08	5 00	
Morse, Edward W.....'08	5 00	
Morse, Frank D.....'09	5 00	
Morse, H. B. ....'08	5 00	
Motter, Murray G. .....'08-'09	10 00	
Moulder, Bettie L. .....'06-'07	10 00	
Moxley, Roland R. ... .'09	5 00	
Mrazek, Leo L.....'07 '08	10 00	
Mueller, J. George ... ..'08-'09	10 00	
Muench, Wm. .....'09	5 00	
Muhlhan, Otto E. .....'08	5 00	
Muir, John D. .....'07-'08	10 00	
Muir, William .....'08	5 00	
Munson, James G. .....'08	5 00	
Munz, Winfield D. .....'09	5 00	
Murray, Alexander.....'09	5 00	
Murray, Benjamin L. .....'08	5 00	
Muth, George G.....'09	5 00	
Muth, John C.....'09	5 00	
Muth, John S.....'09	5 00	
Myers, Carvosso O.....'08	5 00	
Myers, Charles J. .....'08	5 00	
Amount carried forward.....	$5760 00	$38 00

	Annual Dues.	Certificates.
Amount brought forward.....	$5760 00	$38 00
Myerson, Isaac A. .....'08-'09	10 00	
Mygdal, Thorkil ....'09	5 00	
Napp, William G. .....'08-'09	10 00	
Neal, Charles C. .....'08	5 00	
Neal, Charles W. ....'08	5 00	
Neal, Thomas L.....'08	5 00	
Nebig, William G. .....'09	5 00	
Needham, Robert H.....'08	5 00	
Neeley, Guy M. .....'08	5 00	
Nelden, Ralph .....'08-'09	10 00	
Nelligar, Frederick D. .....'08	5 00	
Nelson, Burt E. .....'08	5 00	
Neu, D. Alfred .....'07	5 00	
Newcomb, Edwin L. .....'08	5 00	
Newton, Robert A.....'09	5 00	
Nichols, Thomas B...'06-'07-'08	15 00	
Niece, Frederick E. ..... '08	5 00	
Nitardy, Ferdinand W.....'08	5 00	
Nixon, Charles F. .....'09	5 00	
Noll, Martin J. .....'08	5 00	
Noll, Mathias .....'08-'09	10 00	
Noyes, Chas. R. .....'08	5 00	
Nutt, Sidney M. .....'08	5 00	
O'Gorman, Theophilus V. ...'09	5 00	
O'Hare, James.. .....'09	5 00	
O'Neil, Henry M. .....'09	5 00	
Oglesby, George D. .....'08	5 00	
Ohliger, Willard ....'08	5 00	
Oliver, Frank M. .....'08	5 00	
Oliver, William M.....'09	5 00	
Orme, James H. .....'08	5 00	
Ortenstein, Harry M. .....'07	5 00	
Orton, Ingomar F. ....'09	5 00	
Osborne, Melmoth M. .....'09	5 00	
Osterlund, Otto W.....'08	5 00	
Ott, Clarence R. ....'08	5 00	
Ottinger, James J. .....'09	5 00	
Otto, Theodore G. E.....'09	5 00	
Overbeck, Bernard H., Jr. ..'09	5 00	
Overstreet, Wm. P. .....'09	5 00	
Owen, Frank D. .....'08-'09	10 00	
Paddock, Morris V. .....'08	5 00	
Paris, James E. .....'09	5 00	
Parker, Frederick M.....'08	5 00	
Parkinson, Will S. .. ..'08	5 00	
Partridge, Frank R. .....'c8	5 00	
Patch, Edgar L. .....'08	5 00	
Patch, James A. .....'08	5 00	
Patterson, Charles W.....'08	5 00	
Patterson, G. Orvill.....'07-'08	10 00	
Patton, John F..... '09	5 00	
Pauley, Frank C .....'c8	5 00	
Payne, George F.....'08-'09	10 00	
Peacock, Bertha L. (Mrs.) ..'09	5 00	
Peacock, Josiah C. .....'c9	5 00	
Pearrs, Howard A. ....'c9	5 00	
Pearce, Howard A. .....'c8-'09	10 00	
Pearré, Albert L.....'08	5 00	
Pearson, Joseph F. .....'09	5 00	
Pearson, Paul .....'08	5 00	
Pearson, Wm. A. .....'08	5 00	
Pease, Autumn V. .....'09	5 00	
Pegg, Harry W. .... 'c8	5 00	
Pellerano, Nicholas A. .....'09	5 00	
Perkins, Benjamin A.....'08-'09	10 00	
Perry, Frederick W. R. .....'c9	5 00	
Peters, Henry A. .....'08	5 00	
Peters, Otto R. . .. .'08	5 00	
Petersheim, John F. .....'08	5 00	
Petsche, Bismark Wm. .....'08	5 00	
Petterson, Ernst W. ....'09	5 00	
Pfluger, Henry C. .....'08	5 00	
Phillips, Carrie E. (Miss) ...'c8	5 00	
Phillips, William R. .....'08	5 00	
Pieck, Edward L. .....'09	5 00	
Amount carried forward.....	$6190 00	$38 00

	Annual Dues.	Certificates.
Amount brought forward.....	$6190 00	$38 00
Pierce, Olive B. (Miss).....'07	5 00	
Pierce, William H.....'09	5 00	
Piercy, Joseph C. .....'08	5 00	
Pinaud, Pierce R. .....'08	5 00	
Pirie, Alfred M. .....'09	5 00	
Pitt, John R. .....'03	5 00	
Pitts, William B. .....'08–'09	10 00	
Placak, Harry .....'09	5 00	
Plough, William H. .....'08	5 00	
Poehner, Adolph A. .....'08–'09	10 00	
Poley, Warren H. .....'08 '09	10 00	
Pollard, August T. .....'08	5 00	
Porr, W. F. .....'08	5 00	
Porter, Chilton S. .....'08	5 00	
Porter, Martin L. '06–'07–'08–'09	20 00	
Porter, William H.....'08	5 00	
Potter, Maynard H. .....'09	5 00	
Potts, Thomas H. .....'09	5 00	
Powell, William C. .....'08	5 00	
Pozzi, Frank C. .....'08	5 00	
Price, Charles H. .....'09	5 00	
Price, Joseph . .....'09	5 00	
Printup, Daniel .....'07–'08	10 00	
Prior, Toney .....'08–'09	10 00	
Pritchard, Benjamin E.....'08	5 00	
Puckner, William A. .....'09	5 00	
Pulse, John J. .....'08	5 00	5 00
Quackinbush, Benjamin F. ..'09	5 00	
Quigley, Richard L. .....'08	5 00	
Rabak, Edmund C., Jr. .....'08	5 00	
Raeuber, Edward G. .....'09	5 00	
Rafter, Michael .....'08	5 00	
Ramsdell, Clifford .....'08–'09	10 00	
Ramsey, George .....'09	5 00	
Rapelye, Charles A...'06–'07–'08	15 00	
Rauff, U. Gilbert..... ...'08	5 00	
Rauschenberg, Sidney ...'07–'08	10 00	
Raysor, C. A. ..... .'08	5 00	
Reed, James G.....'09	5 00	
Reid, William W. .....'07–'08	10 00	
Reilly, Robert C. .....'09	5 00	
Reimann, George ..... .'08	5 00	
Remington, J. Percy.....'06–'07	10 00	
Reyer, Emil .....'08	5 00	
Rhode, Rudolph E. .....'08–'09	10 00	
Rich, W. Pitt .....'09	5 00	
Richardson, Frank .....'08	5 00	
Richardson, Horatio S.....'09	5 00	
Richardson, Samuel W. .....'08	5 00	
Richardson, Willard S. ..'08–'09	10 00	
Richtmann, William O.....'09	5 00	
Riefflin, Geo. T. .....'09	5 00	
Riesen, David V. .....'09	5 00	
Riess, Herman W. .....'08–'09	10 00	
Rietzke, H. W. .....'09	5 00	
Rinde, Samuel N. .....'09	5 00	
Ringer, Charles E. .....'07–'08	10 00	
Rippetoe, John R. .....'08	5 00	
Ritter, Clyde.... .....'08	5 00	
Roach, Jeremiah T. .....'08 '09	10 00	
Roadcap, Silas M. .....'08	5 00	
Robertson, Felix O. .....'08	5 00	
Robert, William F.....'08	5 00	
Rockefeller, Howard .....'09	5 00	
Rodemoyer, William E. .....'08	5 00	
Rodgers, Edward J. .....'09	5 00	
Roe, J. Newton .....'08	5 00	
Roe, John T. ....'08	5 00	
Roediger, L. F. . .....'09	5 00	
Roehr, Clarissa M. (Miss) '08–'09	10 00	
Roehrig, Albert M. .....'08	5 00	
Roeller, Edward F.....'07–'08	10 00	
Roemer, Frederick .....'08	5 00	
Roenne, Paul L. .....'08	5 00	
Rogers, Arthur H. .....'08	5 00	
Amount carried forward.....	$6670 00	$43 00

	Annual Dues.	Certificates.
Amount brought forward.....	$6670 00	$43 00
Rommel, Hans C. ....'08	5 00	
Rose, Edward S. .....'09	5 00	
Rosengarten, George D. ....'09	5 00	
Rosenthal, David A. .....'09	5 00	
Ross, Otto E. .....'03	5 00	5 00
Rosenzweig, Benjamin .....'09	5 00	
Roth, Charles R. .....'07–'08	10 00	
Rowles, James O. .....'08	5 00	
Rowlinski, Robert A. .....'08	5 00	
Roziene, Robert, P. M.....'08	5 00	
Rudder, William H. .....'08	5 00	
Ruddimann, Edsel A. .....'09	5 00	
Ruhl, Harry F. .....'09	5 00	
Ruppe, Bernard C. .....'08	5 00	
Rusby, Henry H. .....'08–'09	10 00	
Russell, F. A. .....'09	5 00	
Russell, Hugh C. ....'09	5 00	
Rutz, Walter.....'08	5 00	
Ryan, Ambrose E. .....'08	5 00	
Ryan, Frank G. .....'09	5 00	
Ryder, Horace F. .....'08	5 00	
Saalbach, Carl .....'08	5 00	
Saccar, Michael.....'08	5 00	
Sadtler, Samuel P. .....'08–'09	10 00	
Sala, Albert F. .....'08	5 00	
Salchert, Herman A. .....'07	5 00	
Sandkoetter, H. P. ....'08	5 00	
Sarra, Ernesto .....'08	5 00	
Sass, Stephen K. .....'09	5 00	
Sawyer, Charles H. ....'08	5 00	
Sayers, Milton C. .....'08	5 00	
Sayre, Edward A. .....'08–'09	10 00	
Schaak, Milton F. .....'08	5 00	
Schachleiter, Francis G. ....'08	5 00	
Schadt, Conrad .....'09	5 00	
Scheffel, Louis ....'08–'09	10 00	
Schellentraeger, Ernest A. '07–'08	10 00	
Schenck, Fannie K. (Mrs.) ..'08	5 00	
Scherer, Andrew ....'09	5 00	
Scheuber, Frank A. .....'09	5 00	
Schimelfenig, Charles H. ....'08	5 00	
Schimmel, Maurice S. .....'08	5 00	
Schimpf, Henry W. .....'09	5 00	
Schlabach, Edward J.....'08–'09	10 00	
Schleussner, Chas. F. .....'09	5 00	
Schlosser, Peter.....'09	5 00	
Schlotterbeck, Augustus G...'09	5 00	
Schlueter, Robert E. ....'08–'09	10 00	
Schmid, Henry .....'08	5 00	
Schmidt, Frederick M. .....'09	5 00	
Schmidt, Henry .....'09	5 00	
Schmidt, Valentine .....'08	5 00	
Schmitt, Florian C. .....'08	5 00	
Schmitter, Jonathan .....'08	5 00	
Schneck, George E. .....'08	5 00	
Schneider, Albert ....'07–'08–'09	15 00	
Schnell, Harry J. ....'09	5 00	
Schoenhut, Christie H.....'09	5 00	
Schoenthaler, John P. ...'08–'09	10 00	
Scholtz, Edmund L. .....'09	5 00	
Schopp, Otto.....'08–'09	10 00	
Schramm, Fred C. .....'08	5 00	
Schrank, C. Henry.....'09	5 00	
Schreiber, August .....'08	5 00	
Schreiner, Robert .....'09	5 00	
Schrodt, Jacob .....'08	5 00	
Schubert, John J. ....'08	5 00	
Schueller, Frederick W. ....'09	5 00	
Schuh, Paul G. .....'09	5 00	
Schulte, Alexander, Jr.....'08	5 00	
Schultz, John J.....'09	5 00	
Schulz, Henry L.....'08	5 00	
Schulz, Raymond L. .....'08	5 00	
Schulze, Edw. C.....'09	5 00	
Schulze, Louis .....'08	5 00	
Amount carried forward	$7105 00	$48 00

	Annual Dues.	Certificates.
Amount brought forward.	$7105 00	$48 00
Schumann, Otto G.....'09	5 00	
Schwartz, Maurice P.....'08	5 00	
Schweinfurth, George E.....'09	5 00	
Scofield, J. W.....'08	5 00	
Scott, Clarence A. ...'06-'07-'08	15 00	
Scott, George T..... 07-'08	10 00	
Scott. Wm. C. M.. .....'09	5 00	
Scoville, Wilbur L.....'09	5 00	
Seaman, Frederick A..... '09	5 00	
Searby, William M.....'08	5 00	
Sears, Charles B.....'09	5 00	
Seeley, Anthon H. ... .'08	5 00	
Seibert, Geo. F.....'09	5 00	
Seidell, Atherton ..... '08	5 00	
Seinsoth, John J.....'08	5 00	
Seitz, Lorenz A.....'09	5 00	
Seltzer, Leonard A.....'08	5 00	
Selzer, Eugene R..... ...'09	5 00	
Seymour, James.....'08	5 00	
Shaak, Franklin P.....'09	5 00	
Shanafelt, Fred. P .....'09	5 00	
Shannon, Thomas J.....'07-'08	10 00	
Sharp, Solomon A. .....'08-'09	10 00	
Sharpless, Stephen P.....'09	5 00	
Shaub, Jacob R. .....'08	5 00	
Shaw, Fred C. ....'08	5 00	
Shell, Julius E.....'08	5 00	
Sherman, Charles R.....'09	5 00	
Sherriff, Wm. E.....'08	5 00	
Sherwood, Henry J . ..... '09	5 00	
Shimer, Samuel M. .....'09	5 00	
Shockey, Wm. L.....'09	5 00	
Shpisman, Chas. ... .'09	5 00	
Shreve, John A. .....'08	5 00	
Shudrowitz, Frank S.....'08	5 00	
Shurtleff, Wilford C.....'08	5 00	
Siegenthaler, Harvey N.....'08	5 00	
Siegfried, Henry J ....'08	5 00	
Siegfried, Howard J..'08-'09-'10	15 00	
Sieker, Ferdinand A.....'07-'08	10 00	
Sieplein, Chas. A.....'0	5 00	
Sievers, Arthur.....'08	5 00	
Simon, William. ....'09	5 00	
Skeels, Howard M.....'08	5 00	
Slade, Harry A.. .....'09	5 00	
Slater, Frank H. .....'07-'08	10 00	
Slauson, John G.....'08	5 00	
Sloss, Robert A. .....'09	5 00	
Smith, Albert B. ....'08	5 00	
Smith, B. Frank .....'07	5 00	
Smith, Clarence P. .....'08-'09	10 00	
Smith, Edward W..... .07-'08	10 00	
Smith, Frank M.....'08	5 00	
Smith, F. A. Upsher.....'08	5 00	
Smith, Harley E.....'08	5 00	
Smith, Lauriston S. .....'09	5 00	
Smith, Linville H. .....'09	5 00	
Smith, Theodoric.....'08	5 00	
Smith, Walter V.....'08-'09	10 00	
Snell, Tom, Jr.....'09	5 00	
Snider, Wm. E.....'09	5 00	
Snow, Charles W..... '09	5 00	
Snow, Clyde M.....'08-'09	10 00	
Snow, Herbert W. .....'08	5 00	
Snow, Levi M..... ... '08	5 00	
Soetje, Edward C.....'08	5 00	
Sohrbeck, G. Henry.....'09	5 00	
Sohrbeck, George W.....'09	5 00	
Sollmann, Luitpold.....'08	5 00	
Sollmann, Torald. .....'08-'09	10 00	
Solomons, Isaiah A.....'09	5 00	
Sombart, John E.....'08	5 00	
Sommer, Richard E. W.....'09	5 00	
Sords, Thomas V.....'08	5 00	
Southard, Frank A.....'08	5 00	
Amount carried forward.....	$7550 00	$48 00

	Annual Dues.	Certificates.
Amount brought forward.	$7550 00	$48 00
Spalding, Warren A. .....'09	5 00	
Spangler, Lewis C.....'08	5 00	
Sparks, J. M.....'08	5 00	
Spater, William C. .....'06	5 00	
Spencer, James W.....'08	5 00	5 00
Sprague, John F.....'08	5 00	
Sprague, Wesson G.... . ...'09	5 00	
Spring, George A.....'08	5 00	
Squibb, Charles F. .....'08	5 00	
Stacy, Marion F.....'09	5 00	
Staehle, Louis L.....'08	5 00	
Stahel, Albert W.....'08	5 00	
Stahlhuth, Ernest H. W..'07-'08	10 00	
Stanbarger, Morris H....'07-'08	10 00	5 00
Stanford, William H.. .....'09	5 00	
Stange, Carl F..... .....'08	5 00	
Stanislaus, I. V. Stanley..'07-'08	10 00	
Starrh, Thomas M.....'09	5 00	3 00
Staudt, Albert J. .....'08	5 00	
Steadman, Prescott L.....'09	5 00	
Stearns, Cletus O. .....'08	5 00	
Stearns, William L.... .....'09	5 00	
Stein, Edward T. N.....'08	5 00	
Stein, Jacob H .....'06-'07	10 00	
Stenbuck, Moses A.... .....'09	5 00	
Stephenson, John J.....'08	5 00	
Stevens, Alviso B.....'08	5 00	
Stevens, Edward .....'08	5 00	
Stevens, Frederick S. .....'09	5 00	
Stewart, Alexander ... ..'08-'09	10 00	
Stewart, Francis E.....'08-'09	10 00	
Stewart, John W.....'08	5 00	
Stichel, William K.....'08	5 00	
Stietel, Albert F .....'09	5 00	
Stier, Carl ..... '09	5 00	
Stier, George F..... .....'08	5 00	
Stimson, Charlotte E. (Miss).'08	5 00	
Stoddard, Thomas .....'08'-'09	10 00	
Stone, Clarence G.....'08'-'09	10 00	
Storer, Charles A.....'08	5 00	
Stott, Samuel T. .....'08	5 00	
Stout, Marion A. .....'09	5 00	
Stover, Chas. A.....'09	5 00	
Streeper, Frank P. ... .'08	5 00	
Stringer, Orum H. .....'08	5 00	
Strunz, Christopher E.....'09	5 00	
Stuart, Ernest E. .....'08-'09	10 00	
Stucky, Edward W.....'08	5 00	
Sturtevant, Samuel B.....'08	5 00	
Sullivan, John P.....'09	5 00	
Sultan, Frederick W.....'09	5 00	
Sum, Francis.....'08-'09	10 00	
Summer, Jennie H.....'09	5 00	
Suppan, Leo R. A.....'08	5 00	
Sutton, Arthur D.....'08	5 00	
Swaboda, Adolph.....'09	5 00	
Swaringen, DeWitt C....'08-'09	10 00	
Swartz, Geo. F.....'09	5 00	
Sweet, Caldwell. .....'09	5 00	
Taborelli, Ernest T.....'08	5 00	
Takamine, Jokichi .....'09	5 00	
Taquechel, Francisco	.....	5 00
Taylor, Augustus C. .....'08	5 00	
Taylor, Carleton F. .....'08	5 00	
Taylor, George E.....'08	5 00	
Taylor, M. M.....'09	5 00	
Teeters, Wilber J.....'09	5 00	
Tepe, Louis.....'08	5 00	
Tesche, Adolph G.....'08	5 00	
Thebus, William F.....'08	5 00	
Thomas, Daniel J. .....'08	5 00	
Thomas, Oscar B.....'08	5 00	
Thomas, Robert, Jr. .....'08	5 00	
Thompson Albert D.....'08-'09	10 00	
Thompson, F. A .....'08	5 00	
Amount carried forward.....	$7980 00	$66 00

	Annual Dues.	Certificates.
Amount brought forward.	$7980 00	$66 00
Thompson, John R..... ....'08	5 00	
Thorburn, Albert D. .....'09	5 00	
Thorn, Henry P. .....'09	5 00	
Thornburgh, Thos. R. . ....'08	5 00	
Thorp, Edmund.....'08–'09	10 00	
Thumb, John K.....'08	5 00	
Thurston, Edwin J.....'09	5 00	
Tielke, Maxwell G.....'08	5 00	
Tilton, Claude E..... .....'09	5 00	
Timmons, George D.....'08	5 00	
Tobin, John M.....'08	5 00	
Todd, Albert M.....'08	5 00	
Toner, Robt. T.....'08	5 00	
Toplis, William G.....'06	5 00	
Topping Arthur E..... '09	5 00	
Tracy, Kenneth W.....'08–'09	10 00	
Traynor, Charles F.....'09	5 00	
Treasure, John T. .....'08	5 00	
Treat, Joseph A.....'09	5 00	
Tripp, Arthur H..... .....'09	5 00	
Trolinger, E. F.....'09	5 00	
Trout, John H.....'08	5 00	
Troxler, Constantine, Jr. ....'09	5 00	
True, Rodney H.....'08	5 00	
Tucker, Greenleaf .....'07–'08	10 00	
Turner, E. R. .....'09	5 00	
Tuttle, George O. ....'09	5 00	
Uhlich, Ferdinand G.....'09	5 00	
Utech, P. Henry.....'08	5 00	
Van Aller, Thomas S..... '08	5 00	
Van Dyke, Charles.....'08	5 00	
Van Ness, George I. .....'08	5 00	
Van Schaack, Cornelius P...'09	5 00	
Vanderkleed, Charles E.....'08	5 00	
Vargas, Jorge..... .... '08	5 00	
Vaughan, Parry W.....'07–'08	10 00	
Villere, Rene L.....'06–'07	10 00	
Voelcker, Edwin B..... '08–'09	10 00	3 00
Voigt, Joseph F. ... .'09	5 00	
Von Krakau, James H. W. E.'08	5 00	
Von Stein, John H.....'08	5 00	
Voorhees, Harry B..... '07–'08	10 00	
Voss, Edward, Jr.....'09	5 00	
Votteler, William .....'09	5 00	
Vowell, Louis S. .....'09	5 00	
Waddell, Minor T.....'08	5 00	
Wagner, Arthur C.....'08–'09	10 00	
Wagner, Louis.....'08	5 00	
Wakeman, Nellie A. (Miss) .'08	5 00	
Walbridge, Cyrus P.....'09	5 00	
Waldner, Paul J.....'05–'06–'07	15 00	
Walker, Robert .....'08	5 00	
Walker, Robert H.....'08	5 00	
Wall, Otto A.....'06–'07	10 00	
Wallace, John C.....'08	5 00	
Walsdorf, Edward H.....'09	5 00	
Walton, Lucius L. .....'08–'09	10 00	
Walz, J. Lee.....'09	5 00	
Wanous, Josie A. (Miss)'07-'08–'09	15 00	
Ward, Chas. H. .....'09	5 00	
Ward, Enoch J.....'06–'07–'08	15 00	
Ward, Francis W.....'08	5 00	
Ward, Homer B.....'06–'07–'08	15 00	
Ware, Charles H ... .'08	5 00	
Warfield, James A.....'09	5 00	
Warn, William E.....'09	5 00	
Warner, Francis D..... '08–'09	10 00	
Warner, Wm. Russell .....'09	5 00	
Warner, William R., Jr. ....'09	5 00	
Warren, Lee.....'08	5 00	
Warren, Robert A..... ....'08	5 00	
Washburn, Homer C.....'08	5 00	
Wassmann, Louis W.....'08	5 00	
Watkins, Charles W..... ...'08	5 00	
Watson, Herbert K. .....'08	5 00	
Amount carried forward.....	$8450 00	$69 00

	Annual Dues.	Certificates.
Amount brought forward.	$8450 00	$69 00
Watson, Joseph R.....'08	5 00	
Watson, William, Jr. .....'09	5 00	
Watt, George H. .....'08–'09	10 00	
Weaber, John A.....'07–'08	10 00	
Webb, Edward N. .....'09	5 00	
Webb, John W.....'08	5 00	
Webber, J. Le Roy .....'09	5 00	
Weber, Don C. ....'08–'09	10 00	
Weed, Nelson .....'09	5 00	
Weicker, Theodore.....'09	5 00	
Weilbaecher, Frank E. ..'07–'08	10 00	
Weimar, Henry ..... '09	5 00	
Weinstein, Abraham .....'07	5 00	
Weinstein, Joseph .....'08	5 00	
Weiser, William P. .....'09	5 00	
Weisner, Nicholas F.....'09	5 00	
Weiss, Emil O..... .....'09	5 00	
Weller, Frank P. .....'08–'09	10 00	
Wells, Jas. H. .....'08–'09	10 00	
Werckshagen, Otto .....'08	5 00	
Werner, Rudolph C. ..... '08	5 00	
Werner, Wm. F.....'08	5 00	
Wesner, Henry C. .....'07	5 00	
Westby, Severs .....'08	5 00	
West, Charles A.....'09	5 00	
West, Fred.....'08	5 00	
Wescott, James W.....'08	5 00	
Wetterstroem, Theodore D.'08–'09	10 00	
Wheeler, A. Alton ..... '08	5 00	
Wheeler, Carlton B. .....'09	5 00	
Whilden, Charles B. .....'08	5 00	5 00
Whipple, George H. .....'09	5 00	
White, Charles H. .....'07–'08	10 00	
White, Joseph L.....'09	5 00	
White, Robert C.....'09	5 00	
White, Simeon L.....'08	5 00	
White, Wm. R.....'07–'08	10 00	
Whitehead, Bowe T. .....'08	5 00	
Whitehead, E. T.....'07–'08	10 00	
Whitney, David V..... ....'08	5 00	
Whittington, Wm. G.....'08	5 00	
Whittle, Wm. A..... '09	5 00	
Whitworth, Frank E.....'08	5 00	
Whorton, Carl .....'08	5 00	
Wicarius, Max J..... '08	5 00	
Wiegel, Carl G.....'08	5 00	
Wilbur, Lot .....'08	5 00	
Wilcox, Levi.....'09	5 00	
Wiley, Harvey W. .....'08–'09	10 00	
Willenbrink, Chas. A.....'08	5 00	
Willetts, Charles E.....'08	5 00	
Williams, Edward .....'08	5 00	
Williams, George G.....'07–'08	10 00	
Williams, Seward W.....'08	5 00	
Williamson, Lee .....'06–'07	10 00	
Willman, Wm. G..... '09	5 00	
Willson, George A. .....'08	5 00	
Wilson, Charles F.....'08	5 00	
Wilson, Frederick H.....'08	5 00	
Wilson, William H.....'08	5 00	
Wimmer, Curt P.....'08–'09	10 00	
Winter, Jas H.....'08	5 00	
Wirth, Adam .....'09	5 00	
Wittich, Matthew H.'05-'06-'07-'08	20 00	
Witting, Frederick F.....'07–'08	10 00	
Wittmer, Joseph W. .....'08	5 00	
Wolf, Charles A.....'09	5 00	
Wolf, J. Carlton ....'09	5 00	
Wolf, Michael F.....'08	5 00	
Wolff, Edward H..... .... '09	5 00	
Woltereck, Gustav .....'09	5 00	
Wood, Alonzo F., Jr.....'09	5 00	
Wood, Horatio C., Jr ...'08–'09	10 00	
Wood, James P. .....'09	5 00	
Woodhall, Frederick.....'08–'09	10 00	
Amount carried forward.....	$8925 00	$74 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	$8925 00	$74 00	Amount brought forward. ...	$8975 00	$74 00
Woodman, Walter I. ..... '09	5 00		Young, George O..... ..... '08	5 00	
Wooten, Thomas V..... '08	5 00		Young, James J..... '08	5 00	
Wooyenayka, Keizo. ..... '09	5 00		Yunker, Charles H. ..... '08	5 00	
Wrensch, Henry E., Jr. . ...'09	5 00		Zabaldano, Alexander ..... '08	5 00	
Wright, Charles L..... '08	5 00		Zeamer, Harry W..... '08	5 00	
Wuensch, Charles..... '08	5 00		Zeigler, Howard P..... '08	5 00	
Wulzen, Dietrich H. ..... '08	5 00		Zimmer, Harry E. ..... '08	5 00	
Wunderlich, Edward ..... '08	5 00		Zottmann, William H. ..... '09	5 00	
Wyckoff, Elmer E..... '08	5 00		Zuenkeler, J. Ferd..... '09	5 00	
Yellig, Daniel C..... '08	5 00		Zurawski, Narcys J. ..... '08	5 00	
Amount carried forward.....	$8975 00	$74 00	Total	$9025 00	$74 00

OBITUARY NOTICES.

NAME.	ADDRESS.	ELECTED.	BORN.	DIED.	PRECEPTOR.	COLLEGE.
Berryhill, Henry Pennick	Connelsville, Pa.	1890				
Castelhun, Karl	Newburyport, Mass.	1902	April 16, 1843	January 21, 1910.		
Duckett, Walter G.	Washington, D. C.	1876				
Dougherty, Samuel E.	Linden, N. J.	1875		June 21, 1908.		
Eckert, John	Newark, N. J.	1902	—— —, 1861	February 6, 1908		N. Y. Col. of Pharmacy.
Fieber, Gustavus A.	Cincinnati, Ohio	1903		October 8, 1909.		
Fischer, Henry	St. Louis, Mo.	1901	October 9, 1844	March 30, 1909.		
Gaus, Charles H.	Albany, N. Y.	1879	September 1, 1840	October 31, 1909.		
Gordon, William J. M.	Cincinnati, Ohio	1854	December 25, 1825	July 7, 1909.	J. W. W. Gordon.	
Harlow, Noah Sparhawk	Bangor, Me.	1859	March 21, 1829	June 11, 1909.		
Harrison, William J.	Lakewood, N. J.	1896	January 11, 1852	March 22, 1909.		
Kent, Henry Avery	Elizabeth, N. J.	1880	August 19, 1840	December 30, 1908.		
Kline, Mahlon Norwood	Philadelphia, Pa.	1878	February 6, 1846	November 27, 1909.		
Lawrence, Henry H.	Philadelphia, Pa.	1907				
Moore, Joachim Brickley	Philadelphia, Pa.	1860	February 19, 1832	December 16, 1909.		
Owens, Richard J.	Brooklyn, N. Y.	1860				
Rano, Charles O.	Buffalo, N. Y.	1866	January 1, 1842	May 21, 1909.		
Redsecker, Jacob Henry	Lebanon, Pa.	1881	February 15, 1839	April 20, 1909	Dr. Geo. Ross.	
Schmidt, Florian Charles	Chicago, Ill.	1882		December 12, 1908.		
Schubert, John J.	Kankakee, Ill.	1907				
Scott, William H.	Richmond, Va.	1873	November 17, 1838	June 6, 1909.		
Seabury, George John	New York, N. Y.	1876	November 10, 1844	February 13, 1909.		
Searby, William Martin	San Francisco, Cal.	1882	January 21, 1835	October 7, 1909	E. W. Martin	Royal Pharmaceutical Society of Great Britain.
Sharp, Alpheus Phineas	Baltimore, Md.	1855	August 5, 1824	October 10, 1909	Roberts & Atkinson	Maryland College of Pharmacy.

NAME.	ADDRESS.	ELECTED.	BORN.	DIED.	PRECEPTOR.	COLLEGE.
Simmons, Frank B.	Woonsocket, R. I.	1897	December 15, 1874	January 14, 1909.		
Simms, Giles G. C.	Washington, D. C.	1860	October 16, 1835.	October 19, 1909.		
Spangler, Newton L.	Guthrie, Okla.	1906	May 3, 1878.	October 16, 1908.		
Stein, Jacob Henry	Reading, Pa.	1902	April 24, 1846	May 17, 1909	Jos. L. Lemberger	Philadelphia College of Pharmacy.
Steinmeyer, William O.	Carlinville, Ill.	1901	April 27, 1850	August 31, 1909.		
Stoughton, Dwight George	Hartford, Conn.	1890	March 4, 1851	January 1, 1909.		
Wiegand, Thomas Snowden	Philadelphia, Pa.	1857	November 9, 1825	August 10, 1909.	Haskel & Merrick	Philadelphia College of Pharmacy.
Williams, Richard W.	Three Rivers, Can.	1883	July 15, 1853	January 20, 1909	G. Edson	Montreal College of Pharmacy.
Woodworth, Charles B.	Fort Wayne, Ind.	1900				

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS.

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the *Bulletin* of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed $1200, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of ex-officio members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor of the Bulletin, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually or as often as required to the Council and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership: provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee: or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly-elected member, upon the payment of the annual dues for the year in which he is elected, shall be entitled to the annual volume of the Proceedings and all publications of the Association that are distributed to its members during the year. Any applications for membership made during the fiscal year viz., between July 1 of one year and July 1 of the following year shall be considered as of the current fiscal year; except that persons applying on or after March 1st shall not be *required* to pay the annual dues for that year, but if they do pay such dues they shall receive all the publications to which members are entitled for the year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *three successive years* he may be dropped from the Roll.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of $75.00, or after fifteen years the sum of $50.00, or after twenty years the sum of $25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Three Dollars* or of *Five Dollars*, to receive from the Treasurer respectively a *paper* or *parchment* certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, five Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education; 5. Section on Historical Pharmacy.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. At the fourth and fifth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE IX. The tenth session shall be devoted to the subject of Historical Pharmacy.

ARTICLE X. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE XI. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XII. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XIII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 7. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association, and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 8. Incidental business.

ARTICLE XIV. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read.

Section 4. Reading of the Minutes of the Council.
Section 5. Reading of the Reports of the Treasurer and General Secretary.
Section 6. Reports of Standing Committees shall be read.
Section 7. Reports of Special Committees shall be read.
Section 8. Incidental business.
Section 9. Adjournment subject to the call of the President.

ARTICLE XV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XVI. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVII. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVIII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected ten Standing Committees as follows: a Committee on the U. S. Pharmacopœia and a Committee on Transportation, each to consist of ten members; a Committee on Time and Place of Meeting, a Committee on Commercial Interests and a Committee on Pharmaceutical Education and Legislation, each to consist of five members; a Committee on Scientific Papers, a Committee on Practical Pharmacy and Dispensing, a Committee on Historical Pharmacy, a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers, at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the programme. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the

one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing, composed of members actually engaged in the retail drug business, shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Historical Pharmacy shall be elected by the Section on Historical Pharmacy. It shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy. It shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the committee and be available for reference to any one interested.

ARTICLE X. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association, as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE XI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

CHAPTER XI.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XII.

Local Branches.

ARTICLE I. Local branches of this Association may be formed wherever it may appear that twenty-five members of this Association, in good standing, will participate, provided that no more than one such branch shall be formed in any one State, province, district or territory, unless the additional branches shall be formed at a point distant one hundred miles or more from any branch already established in the same State, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in Article I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of Constitution or By-Law in conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

CHAPTER XIII.

Miscellaneous.

ARTICLE I. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed $300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

ARTICLE III. The Secretary of the Council shall also officiate as Secretary of the Committee on Membership.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:

a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901, 1903, 1909.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be named by the Chairman of the Council.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer, having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Treasurer, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. All motions and resolutions involving the expenditure of any sum in excess of twenty-five dollars shall be referred to the Finance Committee before being acted upon by the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

Fourteenth, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the annual meeting of 1907, held in New York City, it was ordered that the three-year-term of members of the Council elected by local branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council member by a local branch. (See Proc. 1907, p. 25.)

At the fifty-seventh annual meeting, held at Los Angeles, Cal., August, 1909, it was ordered that space be annually set aside in the Proceedings for abstracts of the proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

It was further ordered that the salary year of the officers of the A. Ph. A. be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September. (See Proc. 1909, p. 452.)

It was also ordered that the names of life members, new style, be designated in the Roll and List of Members by means of heavy or black-faced type. (See Proc. 1909, p. 459.)

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871. Michael Carteighe, F. I. C., *London*, 1882. E. M. Holmes, F. L. S., *London*, 1899.

GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877. Dr. Ernst Schmidt, Geh. Regierungsrath, *Marburg*, 1899.

INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in **black type.** Names of Life Members under the old Constitution in *italics.*)

UNITED STATES OF AMERICA.

ALABAMA.

Auburn.

Miller, Emerson Romeo 1895

Calera.

Marsh, George Henry 1908

Fort Morgan.

Thurston, Edwin Joseph 1904

Gadsden.

Cross, Elias Howell 1905
Whorton, Carl 1908

Huntsville.

Walker, Elias Russell 1908

Mobile.

Candidus, Philip Charles 1857
Eichold, Bernard Herbert 1905
Herty, Frank James 1907
Roe, John T. 1907
Van Aller, Thomas S. 1907
Van Antwerp, James Callanan.... 1905

Montgomery.

Knabe, Gustavus Alexander 1876

Prattville.

Scott, Clarence Alexander 1905

Talladega.

McDiarmid, Daniel Palmer 1909

Tuscaloosa.

Bingham, William Ellison 1909

ALASKA.

Douglas.

Smith, Guy Livingstone 1909

Ketchikan.

Ryus, Floyd Eugene 1909

ARIZONA.

Clifton.

Stevenson, Anderson William 1908

Phœnix.

Roziene, Robert Philip Mathias.. 1904

Prescott.

Brisley, Harry 1894

Tucson.

Lough, Thomas Warner 1909

ARKANSAS.

Arkansas City.

Dedman, Richard 1908

Batesville.

McMahan, Stonewall Jackson.... 1908

Blytheville.

Paris, James Ernest..... 1908

Camden.

Morgan, Aylmer Lee 1890

Charleston.

Yunker, Charles Harman 1908

Clarksville.

Warren, Robert Arthur..... 1907

England.

Ayres, Gold 1907

Fort Smith.

Howard, Sam Allen 1907
Sparks, James Mitchell 1894

Hope.

Gibson, John Sceva 1908

Hot Springs.

Bancroft, Richard Bayard 1907
Battles, Wilton Lamar.....1908
Beasley, Robert Sidney 1906
Browning, Ernest Ras 1908
Craft, Oliver Austin 1907
Deming, William Albert 1907
Eisele, Martin Augustine 1907
Ellis, William Henry 1907
Hamilton, Carl 1908
Hogaboom, George Adelbert 1907
Humphreys, Charles John 1907
Hunt, Byrd Henderson 1907
Jeffrey, Frank Dana 1907
Jennings, Algernon Coleman 1907
King, Jacob Harvy Curry 1907
Klein, Ernest Frederick 1894
Lehman, Charles Walter 1907
Lemly, Charles Clifton 1907
Morris, Richard Grant 1907
Nutt, Sidney Matthews 1908
Rowles, James Osborne 1908
Schachleiter, Francis George 1906
Schneck, George Earl 1908
Scholastica, Sister Mary 1907
Taylor, Carleton F. 1908
Weimar, Henry 1907
Whittington, William George 1908

Imboden.

Ketchem, James Spear 1907

Little Rock.

Bond, John Barnitz 1883
Bond, William Catis 1907
Bordeaux, Henry 1907
Dawson, Charles Hampton 1907
Dowdy, Joseph Franklin 1908
Fein, Mary Augustine 1907
Halliburton, Orlando 1908
Hegarty, Charles Kiely 1906
Hodges, Jesse Dibrell 1909
McClerkin, Felix William 1907
Snodgrass, Latta Kavanaugh 1901
Stahel, Albert William 1907

Marianna.

Harrington, Vincent Moore, Jr...1909

Okolona.

Young, James Joseph 1908

Paris.

Hahn, Philip Anton 1908

Piggott.

Potter, Maynard H. 1906

Pine Bluff.

Brightwell, Newton Edward.....1908
Dewoody, William Lawrence 1887

Pocahontas.

Hamil, William Earle 1908

Spadra.

Stewart, John William 1908

Stuttgart.

Webb, John William 1908

Warren.

Appleton, William Riley 1901

CALIFORNIA.

Alameda.

Sutherland, George McKenzie ...1909

Angel Island.

Mason, Myron Robinson 1904

Arcata, Humboldt Co.

Keller, William Otto Emanuel ...1908

Auburn.

Stevens, Frederick Solon 1903

Bakersfield.

Hughes, James Albert 1909

Eureka.

Bohmansson, Robert Hugo 1901
Correll, Eugene Philip 1909
Keller, Charles Frederick, Jr.....1908

Fortuna.

Bowman, Reginald Hamilton 1909

Fresno.

Smith, George Henry 1909

Fruitvale.

Philip, Waldemar Bruce 1908

Gilroy.

Johnson, Edward Franklin 1909

Hanford, Kings Co.

Hefton, Wallace Merfin 1909

Haywards.

Sporndli, Ernest 1906

Kingsburg.

Kimberlin, Ernest Marion 1909

Livermore.

McKown, Joseph Oscar 1906

Long Beach.

Lamb, John Amos 1909
Smith, Harley Earl 1903

Los Angeles.

Baughman, Leo Melzer 1907
Binz, Edward Gabriel 1909
Dickinson, William Richard 1909
Diggs, Lowell Clyde 1907
Dyna, Carl Frederick Julius 1909
English, William Morrison 1907
Freeman, James Joseph 1909
Guest, Wilbert Hillman 1909
Howard, Mrs. Fletcher 1905
Jacobson, William Fosberg 1909
Jones, Thomas William 1907
Kirkland, Derwentwater 1889
Lauer, Emanuel Hiram 1909
Laux, Carl 1909
Leitsch, James Craig 1907
Lewis, George 1909
Lewis, George Arthur 1909
Maas, Arthur Richard 1909
McKenna, Harry A. 1907
Newlon, Howard Marcus 1907
Owen, Frank Dale 1907
Peairs, Howard Allen 1907
Porter, G. Ellis 1909
Ramage, Robert Courtland 1909
Schroeter, Herman M. 1907
Smith, Lauriston Stephen 1892
Voeckell, Henry G. 1909
Watters, Alexander John 1909
Wilson, George Baright 1907

Merced.

Cody, Nelson Lowell Adams 1909

Morgan Hill.

Taylor, Walter Thomas 1907

Mountain View.

Wagner, Louis 1908

Napa.

Levinson, Joseph 1895

Oakland.

Kaplansky, David 1909
Leet, Robert Andrew 1907
Tobriner, Isaac 1909
Varney, Edward Francis 1892

Ontario.

Jesson, Jacob 1872

Orland, Glenn Co.

Birch, May Cushman 1909

Oroville.

Green, Robert Moore 1909

Pasadena.

Ward, Charles Horatio 1909

Petaluma.

Lackenbach, Frederick Isadore 1907

Placerville.

Fairchild, William Francis 1909

Pomona.

Armour, Elmer Eugene 1909

Riverside.

Banks, Walter C. 1907

Sacramento.

Lichthardt, George Henry Philip.. 1902

San Diego.

Strahlmann, Edward 1909

San Francisco.

Arkin, James Andrew 1908
Ashim, Barach Jacob 1908
Baer, Edward Arthur 1907
Baldwin, Edward Lewis 1909
Bayly, Charles Alfred 1889
Bowerman, Kenneth Burton 1909
Boyken, John William 1902
Boyson, John Henry 1905
Briggs, Armand Eugene 1907
Brooks, Phipps Ira 1909
Carey, Henry Benjamin 1909
d'Artenay, Eugene 1907
Dawson, John Henry 1882
Donahue, Henry M. 1907
Donohue, Henry 1903
Drossel, August Adolph 1902

Drucker, August Elisha 1904
Eschmann, Clemens Ludwig 1907
Esters von Krakau, James Henry William 1897
Flint, John Henry 1909
Grazer, Frederick Augustus 1904
Green, Franklin Theodore 1908
Guehring, John, Jr. 1907
Headen, Claude Thomas 1909
Hedegard, Hans Christian 1909
Jorgenson, Edward B. 1902
Lengfeld, Joseph Louis 1909
McDonnell, Herbert Leslie 1908
Miller, Charles 1897
Neal, Charles W. 1907
Poehner, Adolf Adam 1907
Prior, Toney 1905
Roehr, Clarissa May 1908
Schmidt, Albert Frank 1909
Schmidt, Valentine 1887
Schneider, Albert 1899
Selzer, Elliott Edward 1909
Sharp, Solomon Albert 1902
Stange, Carl Frederick 1897
Steele, James Gurden 1859
Wenzell, William Theodore 1870
West, Fred 1906
Whilden, Charles Bennett 1907
Winter, James Henry 1904
Zabaldano, Alexander 1902
Zane, Ralph Raymond 1909

Sanger.

Brehler, Oscar August 1909

San José.

Munson, James Grant 1908
Pellerano, Nicholas Andrew 1909

San Luis Obispo.

Byron, Francis Dawson 1909

San Mateo.

Baskette, Frank E. 1907

San Rafael.

Kronberger, Israel Baruch 1908

Santa Ana.

Dean, Harry Glenn 1907
Kelley, Charles Sprewell 1909

Santa Rosa.

Hahman, Paul Theodore 1909

Sebastopol.

Worth, Thomas Renfro 1909

Vallejo.

Fletcher, David Maass 1904

Willows.

Harrington, Michael Timothy, Jr. 1908

COLORADO.

Boulder.

Bedard, George Henry 1908

Canon City.

Seely, Anton H. 1908

Central City.

Best, John 1886
Davies, Llewellyn Powell 1891

Colorado Springs.

Depeyre, Louis Noel 1894
Martin, Franklin Haynes 1909
Ward, Augustus Jae 1893

Cripple Creek.

Beitenman, William Wallace 1888
Lewis, Griffith R. 1909
Shockey, William L. 1909

Denver.

Alkire, Lewis L. 1908
Anglum, John 1902
Bieser, Charles Leonard 1908
Bresler, Simon L. 1908
Clark, Alfred William 1908
Clayton, Charles J. 1905
Ford, Charles Mangan 1887
Glenn, Oliver Z. 1909
Hall, Frank Morgan 1908
Hover, William Adgate 1895
McCrea, Harry Francis 1908
McKenzie, Robert Henry 1908
Martin, John Albert 1909
Nitardy, Ferdinand William 1905
Scholtz, Edmund L. 1909
Skinner, Charles H. 1909
Soetje, Edward C. 1908
Steadman, Prescott Lawrence.....1909
Swoboda, Adolph 1909
Taylor, George Edward 1895
Thebus, William Frederick 1908
Walbrach, Arthur 1881

Fort Collins.

Scott, Alexander Weir 1906

Glenwood Springs.

Barnes, Charles Dean 1908
Parkison, Will Sanders 1908

Grand Junction.

Sturtevant, Samuel Bevier 1908

Holyoke.

Smith, Frank Myron 1908

Lafayette.

Dow, John Peter 1904

Las Animas.

Hammar, Alrik 1897

Leadville.

Kolsch, Julius 1902

Longmont.

Witting, Frederick Frank 1902

Louisville.

Huber, Joseph A. 1908

Ouray.

Hellstern, Edward 1908

Pueblo.

Strunz, Christopher Ernest 1908

COLUMBIA, DISTRICT OF.

Anacostia.

Weiss, Conrad Henry 1900

Washington.

Blackmore, Henry Spencer 1896
Boyd, George Washington 1883
Bradbury, Wymond Henry 1895
Easterday, Herbert Clifton 1893
Elliot, Charles Houston 1899
Flemer, Louis 1895
Floyd, Henry Bussey 1908
Franzoni, Joseph Dunbar 1900
Gahn, Henry 1902
Henkel, Alice 1902
Henry, Frank Clinton 1894
Herbst, William Parker 1895
Hilton, Samuel Louis 1890
Hoover, George William 1905
Hunt, Reid 1904
Hurlebaus, George William 1895
Kalusowski, Henry E. 1904
Kebler, Lyman Frederic 1894
Keemer, Edgar Brooks 1907
Major, John Richards 1873
Motter, Murray Galt 1904
Neeley, Guy Minick 1900
Pearson, Paul 1908
Pozen, Morris A. 1909
Quigley, Richard Lucien 1902
Rabak, Frank 1905
Richardson, Willard Stowell 1900
Ryder, Louis Wadsworth 1907
Scott, Edward Burroughs 1905
Seidell, Atherton 1907
Sievers, Arthur 1906
Spangler, Lewis Clayton 1902
Spire, William Burton 1908
Stearns, Cletus Otto 1906
Stevens, Edward 1903
Taylor, Augustus Carrier 1900
True, Rodney Howard 1904
Waldner, Paul Jacob 1900
Weller, Franklin Pierce 1900
White, Joseph Leyden 1909
Wilbert, Martin Inventius 1902
Wiley, Harvey Washington 1902

CONNECTICUT.

Bethel.

Garvin, Patrick Joseph 1905

Bridgeport.

Hartigan, Joseph Dennis 1902
Hindle, William Percy 1908
Jamieson, George Alexander 1903
Leverty, John Augustine 1900

Danielson.

Morin, Ludger Joseph 1905

Hartford.

Rapelye, Charles Andrew 1876
Rapport, George L. 1907
Seinsoth, John Jacob 1900
Williams, John Kirby 1875

Meriden.

Mosher, William Wooster 1894

Middletown.

Pitt, John Richard 1872

New Haven.

Fleischner, Charles 1905
Gessner, Emil Adolph 1878
Hodgson, Joseph Arthur 1903
Mix, Willis Lee 1896
Spalding, Warren Alphonso 1876
Wood, Alonzo Felton, Jr. 1890
Wood, James Prior 1890

New London.

Daboll, Horace Hart 1903

Putnam.

Dresser, George Edward 1886

Rockville.

Woodall, Frederick 1908

Stamford.

Finch, Charles Smith 1900

Waterbury.

Ebbs, John Buddington 1905
Newton, Clarke Henry William ..1905
Roemer, Frederick 1905
Walker, Robert 1908
Wilcox, Levi 1903
Woodruff, Roderick Samuel 1876

West Haven.

Andrews, William Augustus Peck. 1909

Winsted.

Judson, Arthur F. 1907

DELAWARE.

Middletown.

Truitt, Ernest Alexander 1908

Seaford.

Haines, William Fischer 1908
Kaufman, Reuben M. 1909

Wilmington.

Watson, Herbert Kennedy 1888

FLORIDA.

Clearwater.

Allen, Bertram 1909

De Land.

Fisher, George Washington 1893

Fort De Soto.

Goodman, Frank Stockett 1907

Jacksonville.

Bettes, C. C. 1909
Cameron, Simon H. H. 1909
Dixon, John Marion 1894
Kirk, James Edgar 1903

Miami.

Abernethy, John Cocke 1904

Ocala.

Groves, Henry Conrad 1903

Palatka.

Ramsaur, David Wilfong 1902

Pensacola.

Petterson, Ernst Wilhelm 1905
Stearns, William Lincoln 1903

Satsuma Heights.

Richtmann, William Oscar 1904

St. Augustine.

Speer, Charles Claude 1902

Tampa.

Berger, Ernest 1902
Russell, Hamilton 1905
Taylor, Milton Mannasseh 1909

GEORGIA.

Atlanta.

Elkin, William Simpson 1905
Kelley, Ruben Benjamin 1905
Payne, George Frederick 1893
Pitts, William Burton 1903

Augusta.

Durban, Sebastian Charles 1883
Land, Robert Henry 1859
Land, Robert Henry, Jr. 1902

Fitzgerald.

Goodman, John Hawkins 1904

Fort Oglethorpe.

Galvin, Mathew 1906

Greensboro.

Culpepper, Thomas Jefferson 1903
Rice, Thaddeus B. 1909

Macon.

Clark, Mallie Adkin 1908
Morris, Max 1898

Rome.

Curry, David W. 1894

Savannah.

La Grange, John V. 1905
Rowlinski, Robert Antone 1892
Solomons, Isaiah Abram 1894

Thomasville.

Thomas, Robert, Jr. 1888

HAWAIIAN ISLANDS.

Honolulu.

Beck, Julius Edward 1904
Pfluger, Henry Christian 1903
Rumsey, Samuel Louis **1876**

Kalawao, Molokar.

Gibson, Frank Leighton 1904

IDAHO.

Boise.

Ballou, Clarence Orlando 1909

Grangeville.

Pulse, John J. 1908

Pocatello.

Dvorak, Joseph Thomas 1908

Shoshone.

Starrh, Thomas McLelland 1909

Twin Falls.

Skeels, Howard Morton 1907

ILLINOIS.

Alton.

Riley, Cassius Marcellus 1901

Aurora.

Frauenhoff, Frederick Louis 1909
Kempf, Frederick F. 1907
Staudt, Louis Carl 1890

Berwyn.

Rinde, Samuel Nelson 1909

Bloomington.

Garver, Christian 1905

Cairo.

Metzger, Arthur Schuh 1908
Metzger, Matthias Clyde 1902
Schuh, Paul Gustav 1894

Camp Point, Adams Co.

Bartells, George Case 1881

Carlinville, Macoupin Co.

Loehr, Theodore Christian 1888

Chicago.

Ackermann, Albert George 1909
Adamick, Gustave Hattenhauer ..1891
Ade, Daniel Andrew 1906
Anderson, Carl Godfrey 1907
Avery, Charles Hamilton 1905
Bachelle, Rudolph von 1906
Bartlett, James E. 1906
Bartlett, Nicholas Gray 1861
Bate, Henry John 1906
Baur, Jacob 1879
Becker, Irwin Atwood 1905
Behrens, Emil Christian Louis ...1893
Bellack, Berthold H. 1909
Biermann, William Henry 1908
Biroth, Henry **1865**
Blahnik, Karel Bartholomae 1907
Blahnik, Marie (Mrs.) 1905
Blahnik, Vencel Lorenz 1907
Blocki, John 1909
Bodemann, Wilhelm 1906
Boehm, John J. 1905
Brenner, George Frederick 1906
Bruder, Otto Emil 1905
Bruun, Harold Nicolai 1905
Buthlein, Fred. L. G. 1908
Cassin, Elmer Eldorado 1907
Chantler, Vincent Huron 1906
Christensen, Henry C. 1906
Clark, Albert Henry 1905
Cooban, Benjamin Slater 1902
Crawshaw, Herbert Harwood ...1907
Crowley, James Patrick 1908
Day, William Baker 1895
Dieden, Frank Xavier 1905
Druehl, Amanda Stahl (Mrs.) ...1903
Druehl, Louis A. 1908
Engelhard, George Pierre 1903
Eysenbach, Henry Philip 1905
Fantus, Bernard 1908
Feldkamp, Charles Louis 1908
Finninger, Paul Ernest 1906
Fischnar, John Ferdinand 1905
Forbrich, Joseph Francis 1908
Forsyth, William Kitchin 1902
Foucek, Charles G. 1909

Friesenecker, Charles M. 1907
Fry, Herman 1902
Fry, Narcys George 1906
Fuller, Oliver Franklin 1869
Gale, Edwin Oscar 1857
Gale, William Henry 1857
Gathercoal, Edmund Norris 1905
Glogan, Alexander 1908
Gordin, Henry Mann 1899
Grassly, Charles William 1884
Gray, Margaret McClintock (Mrs.) 1901
Gray, William 1892
Haeger, Fred. 1906
Haeseler, Loren Milton 1906
Hallberg, Carl Svante Nicanor ..1879
Hartwig, Otto Julius 1892
Hauber, Peter Paul 1906
Heinemann, Lucy 1908
Heiss, Ernest J. 1907
Hellmuth, Joseph Anthony 1905
Hermanek, Joseph Charles 1904
Hilpert, Willis Store 1908
Hiss, Andrew Emil 1906
Hodson, Daniel F. 1907
Hull, Ralph Wilbur 1906
Irvine, Ephraim Dinsmore 1908
Jamieson, Thomas Nevin 1903
Jehlik, Anton Josef 1906
Jensen, Gerhard H. 1906
Johnstone, J. C. 1907
Josenhans, Reinhardt C. J. 1907
Kahn, Julius H. 1905
Karg, George 1907
Klenze, William Theodore 1905
Klore, William Walter 1908
Knoche, William Philip 1908
Koch, Fred. Conrad 1907
Kramer, Wilhelm 1908
Krvavica, Antony 1907
Ladish, Erich Herman 1905
Langenhan, Henry August 1908
Larsen, Lars Peter 1908
Lehman, Louis 1905
Letzler, Alex. Emil 1906
Light, Isam M. 1907
Lorenz, John Stanley 1906
Lueder, John T. 1909
Mares, Frank Martin 1902
Marr, William G. 1908
Martin, John Fraley 1905
Mason, Ernest Lynn 1908
Mathison, Soren 1905
Matthews, Charles Edwards 1893
McClugage, John Jordan 1905
McConnell, Charles Henry 1899
McPherson, George 1865
McQuillen, Francis 1906
McVay, Ernest Avery 1906
Meixner, Fred Morris Frankford .1906
Meyer, Frederick Hugo 1907
Miller, Albert 1907
Miner, Maurice Ashbel 1880
Myers, Charles Joseph 1905
Mygdal, Thorkil 1908
Niethammer, Otto F. 1905
Oglesby, George Daniel 1905
Oldberg, Oscar 1873
Ortenstein, Harry M. 1906
Patterson, Charles Waggener.....1905
Patterson, Theodore Henry 1869
Peska, Alexander Casimer 1909
Pfaff, Henry, Jr. 1907
Phillips, William Robetoy 1908
Pierce, Olive Blake 1906
Potts, Thomas Humphreys 1906
Puckner, William August 1888
Rhode, Rudolph Ernst 1887
Riemenschneider, Julius Henry ..1906
Rommel, Hans Carl 1907
Rose, Edward Spangler 1909
Rounds, Marvin Bird Cleo 1905
Ruesch, William Emmanuel 1907
Salchert, Herman Anton 1906
Sandkoetter, Henry P. 1908
Sass, Stephen Konrad 1905
Sawyer, Hilon Hill 1906
Schaper, Henry Frederick 1905
Scheffel, Louis 1908
Scheips, Theodor Immanuel 1905
Scherer, Andrew 1884
Schimelfenig, Charles Howard ..1908
Schmidt, Frederick Michael 1887
Schmidt, John Jacob 1908
Sheblessy, Michael Albert 1909
Shurtleff, Wilford C. 1905
Snow, Clyde Mason 1903
Snyder, William Edward 1909
Storer, Charles Adelbert 1906
Stadelmann, Hany Edgar 1909
Stephan, Otto Paul 1909
Stimson, Charlotte Elizabeth 1905
Truax, Charles 1882

Umenhofer, Adolph 1908
Van Schaack, Cornelius Peter....1905
Voiss, Arcadius 1901
Warren, Lewis Eugene 1909
Wells, James Herbert 1908
Whitfield, Thomas 1865
Williamson, Wyley Porter 1907
Wilson, Charles Frazee 1906
Wilson, Richard Bruce 1908
Winberg, Washington William ...1906
Woltersdorf, Louis 1865
Wooten, Thomas Victor 1893
Yeomans, Sidney Clarence 1906
Zelinski, Walter Franz von 1905
Zurawski, Narcys J. 1906

East St. Louis.

Knoebel, Percy Thomas 1907
Knoebel, Thomas 1892

El Paso.

Michels, John Barnhart 1909

Evanston.

Benedict, Philip Vincent 1908
Mills, George P. 1907

Fairmount.

Tilton, Claude Enoch 1905

Fort Sheridan.

Riess, Herman William 1903

Freeport.

McNess, Frederick William 1906

Geneseo.

Stamm, Dante Milton 1896

Girard, Macoupin Co.

Deck, Lewis Cass 1901

Grayville.

Madden, St. Clair 1909
Wheatcroft, John Christopher ...1906

Greenup.

Conzet, Rufus Warren 1904

Hawthorne.

Wicarius, Max John 1908

Joliet.

Fahrner, Alphonse Anthony 1906

Moline.

Lindvall, Charles Gustaf 1897
Sohrbeck, George Henry 1888
Sohrbeck, George William 1897

Mount Vernon.

Morse, Edward Worth 1896

Oak Park.

Foster, Frank Homer 1908
McCauley, Charles Edward 1903
Walter, Charles Albert 1899

Orion.

Schneider, Carl Henry 1906

Ottawa.

Duncan, William Dexter 1909

Pekin.

Ehrlicher, Henry Michael 1892

Peoria.

Benton, Wilber Merritt 1888
Lueder, Fritz 1894
Shpisman, Charles 1909

Pesotum.

Hoffman, George Frederick 1902

Polo.

Clothier, Charles Roland 1905

Quincy.

Eisele, George 1908
Heidbreder, Albert Henry 1905

Rock Island.

Hartz, William Theodore 1909
Riess, Adolph John 1909

Sadorus.

Craw, Eugene Eunison 1908

Springfield.

Dodds, Richard Newton 1902

Stronghurst, Henderson Co.

Harter, Isaac Foster 1893

Tuscola.

Stacy, Marion Franklin 1903

INDIANA.

Angola.

Sherrard, Charles Cornell 1893

Bluffton.

Stout, Marion Alphon 1906

Columbus.

Otto, Theodor Gottheli Eduard ..1900
Stahlhuth, Ernest Henry William.1887

Evansville.

Bohn, George W. 1907
Petersheim, John Frederick.....1907
Troxler, Robert Fulton 1902

Fort Wayne.

Emanuel, Julia Esther 1906
Gross, William Otto 1901
Mertz, Edward Leander 1904
Woodworth, Benjamin Studley ...1906

Indianapolis.

Bibbins, Francis Eugene 1909
Blodau, Robert P. 1908
Carter, Frank Henry 1891
Carter, Harlen Wilson 1908
Coons, William I. 1906
Eberhardt, Ernest Godlove 1906
Eldred, Frank Randall 1905
Ferger, Edward 1906
Francis, J. Richard 1906
Frauer, Herman Emanuel 1881
Gertler, John Henry 1905
Hereth, Franklin Samuel 1893
Huder, Henry J. 1894
Hurty, John Newell 1882
Kassulkke, August 1905
Leftwich, Harry Percy 1906
Lilly, Eli 1906
Lilly, Josiah Kirby 1890
Lynn, Charles Jackson 1906
Mueller, J. George 1906
Schopp, Otto 1906
Schwartz, Maurice Paul 1906
Stuart, Ernest Eugene 1906
Stucky, Edward W. 1908
Thorburn, Albert David 1902
Waddell, Minor T. 1899
Walker, William Arthur 1905
Watkins, Charles Williams 1907
Werner, William F. 1908
Zimmer, Harry Edgar 1908

Lafayette.

Green, Arthur Lawrence 1906
Schultz, John Jacob 1904
Sturmer, Julius William 1901

La Porte.

Meissner, Frederick William, Jr...1890

Logansport.

Hoffman, George L. 1906
Hoffman, George William 1904
Porter, William Hamlin 1906

Mishawaka.

Graham, Abner B. 1907

Mt. Vernon.

Fogas, William Henry 1907

New Albany.

Knoefel, Bruno 1896
Knoefel, Charles Deitrick 1894
McDonald, Harry Stewart 1905

New Carlisle.

Warner, Francis Delop 1904

Notre Dame.

Green, Robert Lee 1906

Rockport.

Basye, Taylor Colman 1909

Salem.

Rudder, William Hiram 1907

Seymour.

Loertz, Carl Edward 1907

South Bend.

Bastian, Otto Carl 1903
Coonley, Charles 1902
Eliel, Leo 1883
Meyer, Martin Monroe 1897
Reyer, Emil 1907

Terre Haute.

Cassaday, Burton 1909

Troy.

Gaesser, Theobald Theodore 1901

Valparaiso.

Heineman, Albert F. 1905
Roe, Joseph Newton 1902
Timmons, George Demming.....1905

Warren.

Hickerson, William Henry 1894

Winchester.

Sala, Albert Franklin 1905

IOWA.

Amana.

Koch, August Frank 1903
Schadt, Conrad 1903

Boone.

Ridgway, Lemuel Augustus 1882

Callender.

Larson, Martin 1906

Cedar Rapids.

Boyson, George H. 1908

Charles City.

Legel, John Gotthelf 1897

Clear Lake.

Etzel, John Leonhardt 1897

Council Bluffs.

Spater, William Charles 1905

Davenport.

Ballard, John Winthrop 1871

Des Moines.

Berner, Carl Albert 1903
Macy, Sherman Riley 1891

Dubuque.

Torbert, Willard Horatio 1887
Wittmer, Joseph Washington.....1896

Fort Dodge.

Oleson, Olaf Martin 1877

Fort Madison.

Schafer, George Henry 1871

Homestead.

Miller, Frederick William 1902

Iowa City.

Boerner, Emil Louis 1877
Cooper, Zada Mary 1909
Teeters, Wilber John 1902

Kalona.

Rogers, Ora Leroy 1907

Keokuk.

Kiedaisch, George Arthur 1904

Lawler.

Landon, Ray Irving 1908

Maquoketa.

Nitzsche, John Charles 1909

Marshalltown.

Mayer, Peter 1906

Muscatine.

Halstead, Alice Louisa (Mrs.)....1892

New Hampton.

Sayers, Milton Cary 1906

Pocahontas.

Grover, Robert Oswald 1908

Shenandoah.

Eaton, Harry F. 1909

Sioux City.

Andreen, Carl 1902
Koelle, Otto Charles 1902
Moore, Silas Harwood 1880
Soper, George M. 1909
Scherling, Gustav 1884
Thelander, Creston Carlos 1902

Stuart.

Treat, Joseph Augustus 1885

Waterloo.

Coontz, Floyd 1909

Winfield, Henry Co.

Lindly, John Milton 1901

KANSAS.

Atchison.

Myers, Carvosso Oursler 1904
Noll, Mathias 1901

Ellsworth.

Sherriff, William Ebenezer 1904

Gypsum City, Saline Co.

Schmitter, Jonathan 1892

Lansing.

Shudrowitz, Frank Stanislas 1904

Larned.

Duncan, George Howard 1908

Lawrence.

Emerson, Herbert William 1909
Havenhill, L. D. 1900
Leis, George 1869
Moore, John Thomas 1888
Sayre, Lucius Elmer 1883

Leavenworth.

Mehl, Henry William 1905

Marysville.
Reisen, David V. 1909

Onaga.
Kester, Joseph A. 1904

Ottawa.
Becker, Charles Lewis 1892

Overbrook.
Topping, Arthur Ellsworth 1904

Topeka.
Holliday, Francis Emlen 1900

Wichita.
Chism, John Samuel 1909
Frazier, William John 1909

Winfield.
Friedenburg, Maximilian Wilmer. 1904

KENTUCKY.

Ashland.
Lordier, Charles Joseph 1907

Bowling Green.
Wilson, George Thomas 1907

Covington.
Pieck, Edward Ludwig 1887
Willenbrink, Charles Anthony ...1904

Frankfort.
Gayle, John William 1891

Hawesville.
Patterson, George Orville 1907

Henderson.
Baldauf, Julius Leopold 1907
Elam, John Thomas 1907

Hopkinsville.
Cook, James Otey 1907

Lexington.
Brown, Linwood Arnold 1909
Cooper, James Evans 1907
Harting, Rudolph R. 1902

Louisville.
Bell, Emil Remigius 1890
Buschemeyer, Henry, Jr. 1909
Curry, Gordon Laten 1900
Diehl, Conrad Lewis **1863**
Dilly, Oscar Charles 1888
Dimmitt, Addison 1895
Hurley, Horace Oliver 1907
Jones, Simon Newton **1870**
Krul, John George 1907
Mueller, Otto Edward 1907
Newman, George Abner **1866**
Overstreet, William Payne 1893
Overton, Burr Martin 1903
Peter, Minor Cary 1894
Schlosser, Peter 1902
Schoettlin, Albert John **1882**
Treber, Frederick William 1907
Troxler, Constantine, Jr. 1896
Votteler, William 1895

Marion.
Orme, James Houston 1909

Mt. Sterling.
White, Robin Hope 1907

Newport.
Bange, Otto Franz 1904
Greule, Albert Martin 1903

Paducah.
Koegel, Herman Henry 1907

Paris.
Clarke, Charles Jordan 1904

Shelbyville.
Smith, Lemuel Grant 1909

Upton.
Turner, Edgar Ray 1909

Winchester.
Martin, James Henderson 1908

LOUISIANA.

Alexandria.
Siess, Leo Chester 1909
Wingo, Daniel M. 1909

Monroe.
Allen, William Everett 1909

New Orleans.
Adams, James Ogilvie 1904
Angell, James Richard 1909
Asher, Philip 1905
Baltar, Joseph Thomas 1909
Berlin, Henry 1909
Breslin, Michael Thomas 1905
Brown, George Stewart 1900
Capdau, Pierre August 1902

Claren, George Victor 1909
Conn, Moise Clarence 1909
Dannenmann, Edward 1909
Di Trapani, Anthony 1909
Earhart, Frederick A. 1904
Finlay, Alexander Kirkwood.....1883
Godbold, Fabius Chapman 1887
Grasser, John J. 1909
Guidry, Ambrose Joseph 1903
Henriques, Adolph 1909
Holt, Edwin Merrimon 1902
Kaczowski, Adolph O. 1909
Legendre, Joseph Amilcar 1891
Levy, William Michael 1894
Lobenhoffer, Philip 1909
Lyons, Lucien Eugene 1904
Marion, Etienne James 1903
Metz, Abraham Lewis 1887
Napp, William George 1906
Posey, Henry Gibbon 1905
Samson, Max 1900
Sauvinet, Charles Daniel 1902
Villere, Rene Louis 1905
Walker, Joseph Patrick 1909
Walsdorf, Edward H. 1904
Weilbaecher, Frank Eugene 1904
Wirth, Adam 1904
Wunderlich, Edward 1891

Shreveport.

Spencer, James Woodburn 1908

MAINE.

Auburn.

Burnham, Ralph Foster 1904
Jones, Oscar Winthrop 1902

Augusta.

Coughlin, John 1908
Partridge, Frank Reuben 1895

Bangor.

Davis, Charles Howard 1903
Sweet, Caldwell 1881

Biddeford.

Boynton, Herschel 1875
Traynor, Charles Francis 1902

Brunswick.

Leavitt, Adoniram Judson 1905
Wilson, Frederick Henry 1906

Danforth.

Porter, Martin Luther 1904

Gardiner.

Beane, Chester Hunnewill 1909

Houlton.

Ormsby, Herbert 1909

Kennebunk.

Meserve, Albert Wesley 1905

Lewiston.

Babcock, Percival Warren 1909
Lowell, Edward Mark 1896

Orono.

Jackman, Wilbur Fisk 1899

Portland.

Bierman, Clarence Henry 1908
Cook, Alfred Page 1902
Frye, George Carlton 1879
Hay, Edward Allston 1889
Morse, Frank Dana 1902
Perkins, Benjamin Abbott 1878
Rand, Daniel Moulton 1892
Schlotterbeck, Augustus George..1896
Tuttle, George O. 1907

Saco.

Sawyer, Charles Henry 1896

Skowhegan.

Bucknam, Frank William 1907

York Village.

Sanford, John Foy 1902

MARYLAND.

Annapolis.

Henkel, Charles Bernard 1902

Baltimore.

Bacon, Ephraim 1905
Baily, George Frank 1906
Balmert, Clemens Augustus 1909
Barnett, Joel Jones 1899
Base, Daniel 1898
Bond, John Emory 1907
Brack, Charles Emil 1876
Bunting, George A. 1907
Burrough, Horace, Jr. 1901
Butsch, John Louis 1906
Caspari, Charles, Jr. 1883

Culbreth, David Marvel Reynolds. 1883
Daneker, Howard Nelson 1907
Davis, John Alexander 1894
DeReeves, Antonio Eugene 1909
Dickson, Frederick W. 1906
Dohme, Alfred Robert Louis 1891
Dohme, Charles Emile 1863
Dohme, Louis 1859
Downes, Edwin Richards 1907
Dunning, Henry Armit Brown ... 1902
Elliott, Henry Alexander 1859
Engelhardt, Hermann 1907
Feick, Charles 1901
Fouch, William M. 1906
Frailey, Carson Peter 1908
Frames, John Fuller 1890
Gilpin, Henry Brooke 1889
Hancock, James Etchberger 1907
Hancock, John Francis 1863
Hengst, John Edwin 1900
Hess, Nicholas Alphonso 1908
Heuisler, Philip Ignatius 1903
Hill, Aubrey Thomas 1907
Hodson, Eugene Withers 1907
Hynson, Henry Parr 1890
Jones, Harold Walker 1909
Kelly, Evander Frank 1905
Kelly, Thomas 1907
Lillich, Bert Allen 1907
Lowry, William John, Jr. 1906
Maisch, Henry 1898
Mansfield, Samuel 1898
Meyer, Adolph Carl 1905
Meyer, Charles Lewis 1901
Millard, David Rockwell 1899
Morgan, Charles 1899
Muth, George Giustiniani 1906
Muth, John Clement 1898
Muth, John Sebastian 1898
Neal, Charles Chaplin 1906
Quandt, Ernest Edmund 1909
Schimmel, Maurice Solon 1906
Schulze, Louis 1892
Schumann, Otto George 1902
Smith, Frederick Alfred Upsher . 1907
Smith, Theodric 1890
Sonnenburg, Charles Edward 1909
Stichel, William Kleinheim 1907
Sullivan, John Patrick 1909
Thomas, John Benjamin 1906
Thomas, Oscar Bernard 1907
Walz, Jacob Lee 1906
Ware, Charles Howard 1898
Werckshagsen, Otto 1907
Westcott, James Walling 1890
Whittle, William Aloysius 1908
Williamson, Robert Edward Lee. 1898
Winkelmann, John Henry 1864
Wolf, Charles Augustine 1906
Wolf, James Carlton 1905
Wolf, Michael Francis 1906
Woltereck, Gustav 1909

Brookville.

Howard, Henry 1905

Catonsville.

Simon, William 1885

Chestertown.

Toulson, Milbourne Asbury 1905

Frederick.

Pearré, Albert Lindsay 1906

Hagerstown.

Meredith, Harry Lionel 1900

Snow Hill.

Powell, William Cottingham 1895

Sykesville.

Swain, Robert Lee 1909

Taneytown.

McKinney, Robert Sentman 1898

MASSACHUSETTS.

Amherst.

Deuel, C. Fred 1907

Andover.

Allen, William Annett 1909

Boston.

Baird, Julian William 1894
Baker, Walter Nelson 1906
Bassett, Charles Harrison 1867
Blake, Hany Wilmartt 1909
Burnham, Alfred Augustus, Jr. .. 1891
Cabitt, Harry 1909
Carter, Frederick Louis 1905
Colton, James Byers 1865
Connelly, Fredrick William 1907
Cramer, Max 1881
Doherty, William H. 1909
Doliber, Thomas 1859

Drury, Linus Dana 1871
Finneran, James Francis 1906
Gammon, Irving Parker 1906
Gerald, Herbert Franklin 1906
Godding, John Granville 1875
Griffin, Lyman Whiting 1907
Horton, Charles Henry 1905
Jones, James Taber 1875
Lalor, James Hugh 1908
Pierce, William Herbert 1879
Sawyer, John R. 1908
Sawyer, William Frederick 1885
Sharples, Stephen Paschell 1875
Sheppard, Samuel Arus Darlington 1865
Thompson, Leon Albert 1907
Vargas-Heredia, Jorge 1891
West, Charles Alfred 1892
Wilson, Benjamin Osgood 1859
Williams, George Gorham 1888
Wolff, Daniel Oliver 1909

Brockton.

Randall, Frank Otis 1893

Brookline.

Clapp, Lowell Tuckerman 1905

Cambridge.

Claflin, Walter Addison 1896
Hawthorne, Herman Francis 1909
LaPierre, Elie Henry 1892
McCormick, Peter Joseph 1909
Phillips, Carrie Elizabeth 1894
Seaverns, Martha Gilbert 1902
Stover, Charles Albert 1909

Cambridgeport.

Milligan, John Dean 1900
Norton, George Edward 1895

Clinton.

Burke, Walter Jordan 1907

Concord.

Richardson, Horatio Stillman 1892

Dorchester Centre.

Davis, Charles Henry 1907
Tripp, Arthur Horton 1906

East Boston.

Packard, Charles Herbert 1906

Everett.

Wagner, Arthur Carl 1907

Fall River.

Riddell, Benjamin Franklin 1892

Fitchburg.

Coté, André Alexandre 1904
Day, Edward John 1901
Estabrook, Henry Arthur 1886

Grafton.

Webster, Lloyd Henry 1909

Holyoke.

Heinritz, Herman 1909
Heinritz, Lebrecht Gustav 1902

Hudson.

Wheeler, Carlton Bancroft 1907

Jamaica Plain.

Lewis, Ernest Grant 1892
Smith, Linville Holton 1892

Lawrence.

Bower, Edward A. 1907
Call, Harry Barrett 1909
Dubrule, Rosaire 1909
Forrest, John James 1909
Glover, William Henry 1891
Smith, Albert Burnham 1907

Leominster.

Nixon, Charles Frederic 1900

Lowell.

Bailey, Frederick 1869
Hood, Charles Ira 1871
Willson, George Arnold 1906

Ludlow.

Booth, Albert Edward 1907

Marlboro.

Barnard, Harry Ames 1907
Gorman, Mary Cecilia 1907

Mattapan.

Best, Samuel M. 1906

New Bedford.

Blake, James Edwin 1866
Shurtleff, Israel Hammond 1875

Newburyport.

Davis, Charles Leland 1897
Goodwin, William Wells 1853

Newton.

Crowdle, John Edward 1894
Hubbard, Frederick Arthur 1907
Hudson, Arthur 1882
Woodman, Walter Irving 1893

Newton Centre.

Hassett, Thomas Bernard 1907

Pittsfield.

Engstrom, Ernst Oscar 1906

Plymouth.

Cooper, James W. 1909

Provincetown.

Hurlbert, William Alexander 1909

Raynham.

Crossman, George Alvin 1872

Revere.

Larrabee, Charles William 1906

Roxbury.

Ryder, Horace Foster 1907

Sagamore.

Adams, James Holmes 1906

Salem.

Nichols, Thomas Boyden 1876

Sharon.

Wheeler, William Dexter 1892

Shelburne Falls.

Baker, Edwin 1875

Southborough.

Newton, Robert Albro 1906

Springfield.

Leonard, Edward Fenno 1909

Stoneham.

Patch, Edgar Leonard 1872

Waltham.

Gleason, Patrick Sebastian 1904

West Roxbury.

Summer, Jennie Henrietta 1909

Wellesley.

Fitzpatrick, Patrick Joseph 1908

Winchester.

Knight, Frank Herbert 1909

Worcester.

Brewer, Howard Dickinson 1902
Flint, William S. 1909
Guerin, James Francis 1898
Scott, George Theodore 1883

MICHIGAN.

Ann Arbor.

Calkins, Eleazer E. 1903
Eberbach, Ottmar 1869
Eckler, Charles Ralph 1903
Schlotterbeck, Julius Otto 1888
Stevens, Alviso Burdette 1885

Berrien Springs.

Kephard, Philip 1902

Birmingham.

Cobb, James W. 1909

Coldwater.

Lyon, Arthur George 1909

Detroit.

Averyt, Henry Madison 1907
Francis, John Miller 1906
Gorenflo, Oscar William 1909
Gratton, George Frederick 1909
Hall, William Alanson 1888
Helfman, Joseph 1894
Houghton, Elijah Mark 1889
Iltis, George Washington 1905
Knox, James Wesley Thompson..1898
Lyons, Albert Byron 1885
Mallard, Albert E. 1907
Mann, Charles Frederick 1903
Mason, Harry Beckwith 1896
McClure, Clarence Minor 1907
Nelson, Edwin Horatio 1904
Ohliger, Louis Philip 1871
Ohliger, Willard 1903
Perry, Frederick William Riley..1885
Ryan, Frank Gibbs 1892
Schulz, Henry Louis 1905
Scott, William C. M. 1909
Scoville, Wilbur Lincoln 1891
Seltzer, Leonard Adams 1899
Thompson, Frank Augustus 1908
Vernor, James 1866
Weaver, Clarence Albert 1909
Wheeler, Albert Alton 1906

Flushing.

Sprague, Wesson Gage 1895

Grand Rapids.

Kirchgessner, William Carl 1903
Muir, John Davidson 1903

Ionia.

Gundrum, George 1882

Iron Mountain.

Seibert, George Frederick 1909

Kalamazoo.

Todd, Albert May 1885

Lansing.

Holm, Marinus Larsen 1905
Jones, Mervin Aldrich 1909

Monroe.

Hagans, Daniel Allen 1903

Morrice.

Jordan, Charles B. 1909

Petoskey.

Atkins, Charles Wesley 1908

Pontiac.

Leisenring, Willis 1909

Port Huron.

Rogers, Edward James 1909

Saginaw.

Heim, Henry 1900
Prall, Delbert Elwyn 1902

Traverse City.

Bugbee, Charles A. 1909

Ypsilanti.

Seymour, James 1903

MINNESOTA.

Alexandria.

Holverson, Henry T. 1909

Anoka.

Goodrich, George Herbert 1909

Avoca.

Bachman, Gustav 1905

Duluth.

Abbett, William Allen 1901
LeRicheux, Alfred Charles 1901

East Grand Forks.

Kingman, Ignatius 1904

Fergus Falls.

Biese, John Henry 1908

Jackson.

Colby, Charles Ludwig 1904

Kennedy.

Arneson, Thomas 1906

Lindstrom.

Elfstrand, Wilhelm 1905

Mankato.

Laack, Adolph G. 1909
Lamm, Edward Leo 1906
Thomas, Frank George 1909
Weed, Nelson 1905

Minneapolis.

Allen, E. Floyd 1885
Brosonlee, Sherman H. 1909
Butters, Charles Hayes 1907
Danek, John Francis 1895
Errickson, William Alexander ...1909
Gamble, Stewart 1897
Griffen, Truman 1909
Huhn, Charles Hugo 1905
King, George Alexander Newton 1892
Stuart, Josephine A. Wanous 1897
Sweet, William Herbert 1905
Thompson, Albert Delano 1895
Wittich, Matthew Henry 1897
Wulling, Frederick John 1893

New Ulm.

Eckstein, Andrew Joseph 1895

Ortonville.

Nielson, John 1897

Pelican Rapids, Otter Tail Co.

Axness, Ole Mikkelson 1895

Sleepy Eye.

Keller, Alfred Joseph 1909

St. Paul.

Campbell, Albert Alexander 1902
Clough, Charles Foster 1909
Collier, William Kelly 1897
Conger, Frederic Albert 1907
Conger, Stephen Benson 1907
Frost, William Arthur 1892
Goodsell, Willard R. 1909

Heller, Charles Tomkins 1906
Jelinek, John Peter 1907
Maxwell, Hazel 1909
Noyes, Charles Reinold 1908
Parker, Frederick M. 1902
Rietzke, Herman W. 1909
Westby, Severs 1907

Winona.

Leeb, Theodore Feargod 1903
Rohr, Arthur von 1908

Worthington.

Morland, Robert Lawson 1909

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William 1883

Biloxi.

Stier, Carl 1902

Columbia.

Caine, S. Lee 1904

Ellisville.

Ward, Enoch James 1905

Forest.

Vance, Winfield Scott 1909

Heidelberg.

Lee, Irma Undine 1909

Kosciusko.

Hammond, William Jesse, Jr. 1908

Meridian.

Bethea, Oscar Walter 1902
Lide, Leslie 1909
Renfroe, Harris Burt 1904

Osyka.

Coody, Archible Stinson 1906

Pass Christian.

Taylor, Charles Daniel 1909

Port Gibson.

Shreve, John Alexander 1880

Vicksburg.

Dodge, Murray Mitchell 1909

MISSOURI.

Boonville.

Mittelbach, William 1891

Carrollton.

Petit, Henry McEwen 1860

Centralia.

Hope, Robert Lee 1901

Columbia.

Tilley, Robert Bruce 1909

Jefferson City.

Brandenberger, Adolph 1894

Kansas City.

Amos, Wilbur Stanton 1908
Baker, De Forest 1908
Crampton, Ferd Leslie 1896
Faxon, Henry D. 1909
Federmann, William Martin 1901
Hess, Paul Ludwig 1892
Hogan, John M. 1909
Lee, Richard Henry 1904
Whitney, David Victory 1903
Wirthman, John George 1903
Wirthman, Joseph Charles 1903
Zinn, Charles Edward 1909

Linn Creek.

Moulder, Bettie Leona 1905

Marysville.

Orear, Edwin George 1904

Mexico, Audrian Co.

Llewellyn, John Frederick 1867
Llewellyn, Frederick William 1908

Nevada.

Ballagh, Wilfred Thomas 1901

New Madrid.

Hummel, John Andrew 1901

Sedalia.

Bard, William Evans 1901
Smith, Otis Wilmer 1903

St. Joseph.

Bender, Walter Comstock 1909
Burvenich, Anton 1909
Pierce, Fred. 1903

St. Louis.

Blakeslee, Louis George 1903
Boehm, Solomon 1871
Caspari, Charles Edward 1902
Claus, Otto Ferdinand 1901

Duering, Henry Charles 1901
Falk, John Charles 1900
Fricke, Frederick Henry 1901
Gietner, Charles 1905
Good, James Michener **1871**
Grewe, Louis Frederick 1901
Hagee, William Price 1901
Hagenow, Theodore Frederick...1901
Hahn, CharlesWilliam John Henry 1901
Hemm, Francis 1881
Huegel, Henry Otto Andrew.....1909
Ilhardt, William Kellerman 1901
Ittner, William Frederick 1903
Judge, Charles Rogers 1901
Klie, George Henry Charles 1878
Kurtz, Irwin William 1904
Lang, George, Jr. 1909
Lieberstein, Louis 1909
Mallinckrodt, Edward **1869**
May, Charles Charlotte 1898
Merrell, George Robert 1901
Merrell, Hubert Spencer 1903
Meyer, Theodore Frederick 1901
Morris, George A. 1908
Noll, Martin James 1898
Pauley, Frank Charles 1879
Perry, Frank Vinton 1907
Reilly, Robert Charles 1901
Sander, Enno **1858**
Scheffer, Henry William **1863**
Schlueter, Robert Ernst 1904
Schoenthaler, John Paul 1901
Seitz, Lorenz Aloysius 1901
Sennewald, Emil August 1900
Stolle, Henry Jasper 1903
Sultan, Frederick William 1901
Sum, Francis 1904
Suppan, Leo Richard August 1904
Uhlich, Ferdinand Gottlieb 1881
Vordick, August Henry **1874**
Walbridge, Cyrus Packard 1901
Wall, Otto Augustus 1884
Whelpley, Henry Milton **1887**
Wolff, Edward Henry 1901

Vandalia.

Johnson, Marcy Marion 1907

Washington.

Gallenkamp, Edward William 1903

Webb City.

Wright, Charles Lewis 1901

Webster Groves, St. Louis Co.

Mueller, Ambrose 1894

Wellsville.

McKibben, Robert G. 1909

Windsor, Henry Co.

Wesner, Henry Clay 1901

MONTANA.

Billings.

Warren, Lee 1907

Bozeman.

Mollet, Charles Edwin Francis ..1909

Butte.

Rockefeller, Howard 1900

Great Falls.

Woehner, Frederick A. 1909

Livingston.

Scheuber, Frank Augustus 1905

Missoula.

Coffee, Sidney J. 1909

NEBRASKA.

Adams.

Killen, Daniel J. 1909

Arlington.

Weber, Don Cæsar 1908

Auburn.

Dort, Edward Harvey 1903

Fairbury.

Pease, Autumn Vine 1893

Fremont.

Koss, Frank 1907
Kreizinger, Carl Ludwig 1907

Grand Island.

Baumann, Oscar 1908

Greeley.

Clough, Frank Harrington 1905

Holbrook.

Butler, Guy 1909

Holdredge.

Fink, Daniel Jacob 1903

Kenesaw.

Mikkelsen, Niels 1903

Lincoln.

Haschenburger, Edmund Ommen. 1907
Lyman, Rufus Ashley 1908

Louisville.

Frater, George 1909

McCook.

McConnell, Lewis William 1904

Oakland.

Simon, Frank 1907

Omaha.

Bexten, Edward William 1908
Cermak, Emil 1908
Fricke, Charles B. 1909
Mares, Ferdinand Louis 1897
Myers, Preston Brown 1897
Sherman, Charles Rollin 1889
Thorp, Edmund 1908

Plattsmouth.

Fricke, Frederick George 1903
Gering, Henry R. 1907

Stella.

McBride, James G. 1909

Sterling.

Heilman, Belle Caricita 1909

Superior.

Kendall, Wallac Warren 1903

Wynot.

Schulte, Alexander, Jr. 1908

NEVADA.

Tonopah.

Piercy, Joseph Clifton 1908

Winnemucca.

Brown, William A. 1909

NEW HAMPSHIRE.

Berlin.

Lyford, Earle Howard 1903

Hillsboro.

Moxley, Roland Rufus 1907

Manchester.

Knowlton, George Harry 1907

Portsmouth.

Grace, William Day 1896
Green, Benjamin 1888

Somersworth.

Hurd, John Charles 1892

West Derry.

Bell, Samuel Howard 1890

NEW JERSEY.

Atlantic City.

Deakyne, Harry Hartup 1905
Jackson, Charles Henry 1907
Westcott, William Carter 1896

Bernardsville.

Squibb, Charles Fellows 1901

Bloomfield, Essex Co.

Gardner, Robert Winslow 1867

Bridgeton.

Dare, Charles Ford 1889
Jorden, Henry Albert 1902
Whipple, George Henry 1902

Burlington.

Sparks, Edgar Reed 1909

Camden.

Barrett, Charles Llewellyn 1902
Beringer, George Mahlon 1893
Beringer, George Mahlon, Jr. 1905
Weiser, William Peiffer 1902

Carlstadt.

Niederer, Albert 1909

Collingswood.

Vanderkleed, Charles Edwin 1902

East Orange.

Williams, Seward Whiting 1887

Elizabeth.

Frohwein, Richard 1867
Oliver, William Murray 1875
Schmidt, Henry 1904
Stutzlen, Frank Charles 1902

Englewood.

Brown, Lewis W. 1907

Fort Hancock.
Kauffman, Emmett Clarence 1907

Fort Lee.
Kaiser, Herman W. 1907

Frenchtown.
Harman, Harry M. 1909

Glen Ridge.
Doolittle, Roscoe Edward 1909

Hackensack.
Franck, Adolf 1909

Haddonfield.
Willard, Rowland 1902

Hoboken.
Klussmann, Hermann 1876
Sieker, Ferdinand August 1893

Ironia.
Coleman, John H. 1902

Jersey City.
Abernethy, Maxwell 1865
Gallagher, John Charles 1893
Lane, John Joseph 1909
Lohmann, Herman J. 1896
Stein, Edward Theodore North...1902

Jersey City Heights.
Bongartz, Ferdinand Alphonse ...1905
Foulke, James 1881
Kuehne, Charles 1902

Kearney.
Shaak, Franklin Philip 1906

Keyport.
Warn, William Edgar 1886

Medford.
Thorn, Henry Prickett 1879

Montclair.
Dohme, William Ignatius 1907
Wrensch, Henry Ernest, Jr. 1902

Mount Holly.
Jones, Edward B. 1909

Morristown.
Carrell, Eugene Ayres 1875

Newark.
Bear, Pierce B. 1905
Foster, John Benjamin 1901
Hain, Frank William August 1905
Holzhauer, Charles 1873
Holzhauer, Charles William 1907
Marquier, Adolph F. 1909
Menk, Charles William 1898
Rusby, Henry Hurd 1890
Sayre, Edward Augustus 1877
Scholz, Oscar Robert Bruno 1909
Smith, Clarence Pennington 1890
Staehle, Louis Lorenz 1898
Stanford, William Harrison 1876
Wuensch, Charles 1898

New Brunswick.
Kilmer, Frederick Barnett 1886
Rust, Schuyler Scott 1905

Orange.
Behrens, John Frederick 1908

Perth Amboy.
Parisen, George Warren 1892
Seaman, Frederick Anthony 1905

Phillipsburg.
Anewalt, Ellsworth Quincy 1901

Plainfield.
Schreiner, Robert 1906

Rahway.
Smith, Joseph George 1909

Red Bank.
Van Derveer, Robert Hutchinson 1903

Roebling.
Hires, Lewis Moore 1907

Sea Isle City.
Wendel, Henry Edward 1873

South Amboy.
Jacques, George Washington 1869

South Orange.
Feindt, Louis F. 1906

Tenafly.
Bower, Edwin Lawrence 1909

Verona, Essex Co.
Rich, William Pitt 1902

Vineland.
Newcomb, Edwin Leigh 1906

West Hoboken.

Maggio, James Innocenzo 1907
Neu, Daniel Alfred 1903
Taborelli, Ernest Thomas 1908

Wetsfield.

Frutchey, George Watson 1909

Woodstown.

Andrews, George Mason 1909

NEW MEXICO.

Albuquerque.

Ruppe, Bernard Charles 1908

Fort Stanton.

Bell, John Michael 1908
Ott, Clarence Roy 1908
Southard, Frank Allan 1903
Van Ness, George Ide 1904

Las Vegas.

Murphey, E. G. 1909

Santa Fe.

Palmer, William Gordon 1909

NEW YORK.

Albany.

Bradley, Theodore James 1896
Bradt, Warren Lansing 1903
Dillenback, Garet Van der Veer..1902
Michaelis, Gustavus 1882
Taylor, Henry Lewis 1906

Auburn.

Adams, Arthur Ellison 1902
Hunter, Sylvester Woodbridge ..1909
Sears, Charles Barager 1906

Bayside, L. I.

Gregorius, William Paul 1907

Binghamton.

Nelson, Burt Everett 1902

Brooklyn.

Anderson, William Christine 1900
Bartley, Elias Hudson 1893
Brooks, George Washington 1879
Brundage, Albert Harrison 1892
Cantor, Lorentz 1907
DeForest, William Pendleton 1879
DeJonge, Cornelius 1899
Dewender, William Henry 1896
Diehl, August 1909
Dissosway, Thurston N. 1905
Dunn, John Augustus **1867**
Eccles, Robert Gibson 1885
Fischer, Albert 1904
Fougera, Edmund Charles Henry..1890
Hoburg, William August, Jr. 1909
Kleine, Oscar Clemens, Jr. 1903
Maisel, Joseph 1908
May, Louis 1902
McElhenie, Thomas DeArmond...1872
McMahon, Joseph 1897
Muir, William 1907
Myerson, Isaac Aaron 1906
Raubenheimer, Otto 1902
Rosenzweig, Benjamin 1898
Schaak, Milton Franklin 1906
Snyder, Ambrose Chancellor 1867
Stenbuck, Moses Abraham 1907
Tuthill, Frederic Percival 1899
Warner, Louis Henry 1907
Webber, Joseph LeRoy 1886
Werner, Rudolph Carl 1882
Wicks, Otto 1907
Wyckoff, Elmer Ellsworth 1906

Buffalo.

Bentz, Henry George 1904
Dimond, Harry John 1904
Gregory, Willis George 1886
Hayes, Horace Phillips 1880
Reimann, George 1902
Richardson, Samuel William 1897
Stoddart, Thomas 1900

Cambridge.

Richardson, Frank 1906

Catskill.

DuBois, William Laneman 1880

College Point.

Hartz, Johann Daniel August 1902
Klein, Edward Nicholas Emil 1905

Corning.

Cole, Victor Le Roy 1890

Dannemora.

Sloss, Robert Audley 1901

Delmar.

Huested, Alfred Birch 1879

Dunkirk.

Davis Eugene Miller 1892

Ellis Island.

Macdowell, William Foster 1904
O'Gorman, Theophilus Vincent ...1897

Elmira.

Holmes, Clayton Wood 1873

Flushing.

Hepburn, John 1873

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Little Falls.

Hurley, John 1909

Middletown.

King, James Theodore 1859
Rogers, William Henry 1869
Shimer, Samuel Mortimer 1904

Monticello.

Isakovics, Alois von 1905

Moravia.

Hawley, Ralph Wright 1908

Mount Vernon.

Rauschenberg, Sidney 1900
Stone, Clarence George 1901

New York City.

Allison, William Outis 1895
Alpers, William Charles 1890
Ayres, Albert John 1907
Ballard, Charles William 1908
Balser, Gustavus 1875
Baltzly, Albert Bates 1907
Beilstein, Christian 1907
Berger, Louis 1907
Bigelow, Clarence Otis 1900
Billings, Henry Merry 1869
Boeddiker, Otto 1895
Brucker, Carl Friederich Jacob ..1902
Chandler, Charles Frederic 1867
Coblentz, Virgil 1882
Cohn, Alfred I. 1905
Cook, Thomas Penrose 1877
Conyngham, William Boulton ...1909
Cosby, Charles Reynolds 1909
Craig, Hugh 1907
Daggett, Volney Chapin 1901
Darling, Joshua Ferris 1909
Diamond, Peter 1905
Diekman, George Charles 1898
Diner, Jacob 1906
Duble, Jesse Balderston 1904
Ennis, Ephraim Leonard 1906
Erhart, William Hermann 1907
Evans, William J. 1908
Evans, William Jesse 1904
Fairchild, Benjamin Thomas 1875
Fairchild, Samuel William 1887
Ferguson, George Albert 1905
Flowers, Hiland 1904
Fraser, Horatio Nelson 1888
Gable, Ralph Benton 1902
Gane, Eustace Harold 1895
Geisler, Joseph Frank 1889
Goeckel, Henry Joseph 1908
Goetting, Ernest C. 1909
Green, Edward T. 1905
Gregorius, George Gust. Chas. Wm. 1898
Hackenberger, George Washington 1907
Haddad, Saleem Faris 1902
Hamann, William Augustus 1907
Harkany, Samuel 1907
Hatcher, Robert Anthony 1905
Hauenstein, William 1883
Haynes, David Oliphant 1887
Hays, Francis Banks 1902
Henning, Adolph 1905
Heydenreich, Emile 1867
Hirseman, Felix 1907
Hitchcock, George Henry 1902
Hopkins, Jesse L. 1898
Hudnut, Richard Alexander 1899
Jungmann, Julius 1879
Juster, Herman 1908
Kalish, Oscar G. 1900
Kantrowitz, Hugo 1907
Keenan, Thomas John 1894
Kemp, Edward 1903
Kennedy, Ezra Joseph 1887
Kirchgasser, William Charles 1888
Koch, William Julius 1907
Lamar, William Robinson 1901
Lampa, Robert Raymond 1892
Lascoff, Jacob Leon 1903
Latham, Thomas 1907
Lovis, Henry Christian 1892
Lowe, Charles H. 1908
Main, Thomas Francis 1872
Mandelbaum, Marcus R. 1909

Mansfield, William 1907
Mayer, Joseph L. 1905
Mayo, Caswell Armstrong 1893
McCartney, Frank Leslie 1907
McCoy, James Edward 1907
McIntyre, Ewen 1873
McIntyre, Ewen, Jr. 1903
McKesson, Donald 1906
McKesson, George Clinton 1888
McKesson, John, Jr. 1867
Molwitz, Ernst 1867
Moore, Thomas Henry 1907
Murray, Benjamin Lindley 1896
Niece, Frederic Ellwood 1903
O'Neil, Henry Maurice 1879
Pfaff, Edward Franz 1907
Plaut, Albert 1894
Porr, William Henry 1908
Quackinbush, Benjamin Franklin. 1886
Rafter, Michael 1908
Ramsdell, Clifford 1907
Ramsey, George 1907
Ramsperger, Gustavus 1860
Riefflin, George T. 1909
Rippetoe, John Ross 1907
Robinson, William Josephus Marir 1902
Roediger, Louis Frank 1909
Roenne, Paul Ludwig 1908
Runyon, Edward Wheelock 1875
Sacks, Bernard 1907
Sahm, Louis Napoleon 1905
Schenck, Henry 1903
Schieffelin, William J. 1892
Schimpf, Henry William 1894
Schleussner, Charles Frederick ...1902
Schmid, Henry 1887
Schnell, Harry Julius 1906
Schweinfurth, George Edward ...1907
Scott, Harry 1907
Seil, Harvey A. 1909
Skelly, James Joseph 1866
Smith, Claude Robert 1909
Spring, George Alexander 1907
Stephenson, John Joseph 1905
Timmermann, Richard Herman...1909
Takamine, Jokichi 1898
Weicker, Theodore 1905
Weinstein, Abraham 1904
Weinstein, Joseph 1905
Weiss, Emil Otto 1907
White, Charles Hugh 1902
Wickham, William Hull 1870
Wilson, William Henry 1907
Wimmer, Curt Paul 1907
Wooyenaka, Keizo 1907

Plattsburg.

Hitchcock, John E. 1892

Rochester.

Hyde, Byron M. 1908

Salamanca.

Krieger, John Christian 1908

Saratoga Springs.

Fish, Charles Frederick 1866

Sayville.

Thornhill, Sewell 1909

Stapleton, Staten Island.

Becker, Ulrich William 1904
Crolley, Theodore Alexander 1909
Roehrig, Albert Michael 1902

Syracuse.

Dawson, Edward Seymour, Jr. ...1876
Muench, William 1899
Smith, Rufus E. 1907
Snow, Charles Wesley 1876

Tarrytown.

Russell, Frederick Avery 1909

Tottenville.

Lehman, Charles Norton 1909

Utica.

Evans, Arthur S. 1907
Slauson, John Gordon 1907
Watson, William, Jr. 1902

Yonkers.

Petsche, Franz Friedrich Bismarck Wilhelm. 1892

NORTH CAROLINA.

Asheville.

Pfafflin, Henry Adolph 1892
Raysor, Cornelius Ayer 1908

Chapel Hill.

Howell, Edward Vernon 1900

China Grove.

Swaringen, DeWitt Clinton 1905

Durham, Orange Co.

Vaughan, Parry Wyche 1882

Fayetteville.
Horne, Warren Winslow 1902

High Point.
Ring, William Alexander 1909

Kinston.
Hood, William Dameron 1905

Lenoir.
Shell, Junius E. 1908

New Bern.
Bradham, Caleb Davis 1902

Rowland.
Ward, Homer Benjamin 1901

Tarboro.
Zoeller, Edward Victor 1878

Tryon.
Oliveros, Sidney Alphonse 1907

Wilmington.
Hardin, John Haywood 1881

Winston-Salem.
McArthur, Robert Milton 1908

NORTH DAKOTA.

Abercrombie.
Ware, Clarence Walter 1907

Bismarck.
Finney, Burt 1909

Cooperstown.
Bateman, Herbert Howard 1909

Fargo.
Bentson, Bernard Leo 1909
Hallenberg, Oscar 1909
Meredity, Cela Robert 1909
Porterfield, William Perry 1909

Grafton.
Haussamen, Henry Louis 1906

Lansford.
Bromme, William Louis 1907

Lisbon.
Parker, William Stillman 1909

Sharon.
Simmons, Gustav Tobias 1903

Valley City.
Siegfried, Henry J. 1905

Willow City.
Master, Walter 1909

OHIO.

Ada.
Mohler, David Christian 1906

Akron.
Dutt, William 1905
Green, Walter Lowell 1909
Lemasters, William Otterbein 1905

Ashtabula.
Allen, Andrew Campbell 1905
Tracy, Kenneth William 1907

Barnesville.
Ely, Ernest Sykes 1904

Bellevue.
Brinker, John Henry 1906

Bucyrus.
Munz, Winfield David 1909

Canton.
Roth, Charles Robert 1900
Schlabach, Edward John 1904
Shanafelt, Fred. P. 1909
Sollmann, Luitpold 1908

Chillicothe.
Howson, Arthur Bayshawe 1886

Cincinnati.
Apmeyer, Chares Ascau 1906
Drackett, Philip Wilbur 1908
Fennel, Charles Theodore Piderit.1886
Forbes, James Winchell 1905
Freericks, Frank Herman 1905
Gansz, William Henry 1905
Greyer, Julius 1880
Katz, Otto 1904
Kisker, Frederick William 1906
Kutchbauch, John Frederick 1904
Lloyd, John Uri 1870
Merrill, Charles George 1888
Merrell, George 1879
Overbeck, Bernard Henry Jr. 1906
Serodino, Herman 1880
Stier, George F. 1907
Voss, Edward, Jr. 1904

Wetterstroem, Theodore David ..1897
Yorston, Matthew Mackay 1864
Zuenkeler, John Ferdinand 1887

Circleville.

Fickardt, Frederick Lutz 1904

Cleveland.

Arny, Harry Vin 1891
Bechberger, Henry 1904
Benfield, Charles William 1893
Benfield, Walter Edwin 1908
Boldt, Frederick William 1905
Braun, Julius C. 1909
Cobb, Ralph Lathrop 1883
Coleman, Glenn Forrest 1909
Feil, Joseph 1885
Fischer, Henry John 1902
Fox, Willard Milton 1903
Graebner, Otto Henry 1907
Haake, William Henry 1893
Hankey, William Tabor 1902
Hannan, Owen Burdette 1893
Hechler, Edward Henry 1904
Hopp, Lewis Christopher 1876
Krause, John 1906
Krejci, Leo Charles 1907
Kuder, William Frank 1893
Lehr, Philip 1885
Maguire, Edward Sylvester 1897
Miller, Frederick John 1902
Mitermiler, John Alfred 1903
Muhlhan, Otto Emil 1905
Petersilge, Emil 1909
Placak, Harry 1902
Pratt, Thomas Matthew 1906
Rosenberg, Samuel Solomon 1907
Schellentrager, Ernest August ...1906
Schmitt, Carl 1906
Schoenhut, Christian Henry 1888
Selzer, Eugene Reinhold 1893
Sherwood, Henry Jackson 1894
Sollmann, Torald 1908
Sieplein, Charles Augustus 1904
Sords, Thomas Vincent 1893
Tielke, Maxwell Gustave 1904

Columbiana.

Ink, Charles Elliott 1885

Columbus.

Ackerman, Philip Jacob 1906
Baigent, John T. 1906
Dye, Clair Albert 1901
Haney, Thomas Carlyle 1903
Hatton, Ellmore Wright 1894
Herpich, John Le Dure 1906
Kaemmerer, William Frederick ..1899
Kauffman, George Beecher 1882
Kiler, Abdel William 1908
Matson, George Hiram, Jr. 1869
Ogier, William Robert 1901
Rauschkolb, John 1894
Sauerbrun, Otto Orville 1905
Schueller, Frederick William 1880
Webb, Edward Nathan 1905
Wendt, William Carl 1901

Conneaut, Ashtabula Co.

Symonds, Arthur Henry 1892

Dalton.

White, Albert J. 1907

East Cleveland.

Reed, James Garfield 1909

East Liverpool.

Holloway, Jesse Daniel 1905

Elyria.

Craine, Percy P. 1908

Grand Rapids, Wood Co.

Thurston, Azor 1886

Hillsboro.

Garrett, Oscar Newton 1902

Hopedale.

Stringer, Orum Hines 1905

Logan.

Harrington, Frank 1869

Massillon.

Baltzly, Zachariah Taylor 1905

Navarre.

Grossklauss, John Ferdinand 1859

New Philadelphia.

Schlup, Samuel, Jr. 1908

Pomeroy.

Roush, Frederick Alman 1905

Sandusky.

Biehl, Lewis A. 1908

Scio.

Beal, George Denton 1907
Beal, James Hartley 1892
Creighton, Mary Louisa 1903

Springfield.

Siegenthaler, Harvey Newton 1882
Stanbarger, Morris Howard 1906

Toledo.

Bowman, Waldo Moffett 1905
Huston, Thomas Benton 1904
Huston, Thomas William 1908
Lembke, Carl Henry Frank 1907
Loesser, Paul A. 1906
Ludwig, William Edward 1904

Troy.

Tobey, Charles William 1909

Upper Sandusky.

Von Stein, John Henry 1904

Washington.

Warfield, James Allen 1905

Waverly.

Dean, Augustus Horace 1908

Youngstown.

Cassaday, Orlin Ulysses 1899
Ohl, J. D. 1909

Zanesville.

Highfield, Herbert Monroe 1908

OKLAHOMA.

Beggs.

Flood, Daniel A. 1909

Caddo.

Dodd, William F. 1909

Checotah.

Kniseley, Herman Dee 1905

Durant.

Schenk, Fannie Kennedy (Mrs.).1906

Edmond.

Loster, John Wesley 1908

Guthrie.

Lillie, Foress Ball 1900

Hennesey.

Dinkler, Frank Adam 1900

Hugo.

Lucas, George Robert 1909

Idabell.

Knisely, Elmer L. 1909

Medford.

Neal, Thomas Lindsey 1904

Muldrow.

Breedlove, Wharton Hicks 1909
Knisely, John Ross 1909

Muskogee.

Hancock, Numa Fletcher 1909

Norman.

De Barr, Edwin 1905
Washburn, Homer Charles 1905

Oklahoma City.

Westfall, Paul 1909

Pauls Valley.

Bruce, Clarence Perkins 1909

Pond Creek.

Dow, Charles Asher 1909

Shawnee.

Machenheimer, Don Grover 1906

Stroud.

Burton, John Clement 1902

Sulphur.

McGinnis, E. K. 1908

Tulsa.

Impey, William Francis 1909

OREGON.

Ashland.

McNair, John Sydenham 1909

Astoria.

Laurin, Theodore Frithiof 1909

Corvallis.

McKellips, Clarence 1909

Eugene.

Kuykendall, William A. 1909

Grants Pass.

Slover, James Anderson 1909

Hood River.

Clarke, Charles Noble 1909

Marshfield.

Brown, James Lee 1903

North Bend.

Everitt, Miles Elsworth 1909

Pendleton.

Koeppen, Albert C. 1909

Portland.

Allen, Alonzo Wright 1909
Byerley, Fabian 1909
Clarke, Louis Gaylord 1909
Crysler, Ralph 1909
Gradon, Walter Allen 1909
Kaack, Ludolph George 1909
Koehler, William Francis 1909
Laue, John Max Alfred 1904
Lowthian, John Peter 1909
McMillan, Daniel Newcomb 1909
Plummer, Rass Miles 1909
Pozzi, Frank Camillo 1908
Ricen, Joseph Moses 1909
Rich, Stanley Hawton 1909
Robertson, Felix Otey 1890

Salem.

Harbord, Kittie Walker 1905

Silverton.

Johnson, Lewis 1909

The Dalles.

Blakeley, George Clarence 1892

Union.

Reuter, Walter Henry 1907

Wosco.

Marsh, Josiah 1909

PENNSYLVANIA.

Allegheny City.

Sample, Oliver Hazen 1907

Ardmore.

Morse, Horace Binney 1908

Bellevue.

Young, David Boyer 1908

Braddock.

Czyzewski, B. J. 1909
Kutscher, George William 1905
Latou, William L. 1908

Butler.

Grohman, Edward John Charles .1909

Canonsburg.

Morron, George Shattuck 1905

Carlisle.

Horn, Wilbur Fisk 1876

Carrick.

McNulty, James Cleland 1909

Castle Shannon.

Doyle, Joseph Jesse 1909

Chambersburg.

Greenawalt, S. Miller 1907

Charleroi.

Gruen, John George 1906

Columbia.

Zeamer, Harry Wisler 1905

Crafton.

Kossler, Herman Stanislaus 1905

Du Bois.

Hay, Charles La Mar 1898

Duquesne.

Pietkiewiez, Wladyslaw Lion 1908

Easton.

Anspach, Paul Bucher 1903
Voorhees, Harry Burns 1906

Edwardsdale.

Lohmann, John 1904

Elkins Park.

Osborne, Melmoth Mercer 1906

Harrisburg.

George, Charles Theodore 1873
Gorgas, George Albert 1884
Smith, Benjamin Franklin 1892

Hatboro.

Rothwell, Walter 1907

Haverford.

Harbaugh, Wilson Linn 1896

Homestead.

Bandy, Lewis Abram 1908
Markowitz, Abe 1909
Smetana, Andy Joseph 1909

Houtzdale.

Arnold, William Charles 1908

Indiana.

Houck, David Lee 1909

Jefferson, Greene Co.

McGovern, John Francis 1906

Johnstown.

Campbell, Andrew 1909
Griffith, Charles 1900
Griffith, James Arthur 1905

Kingston.

Pegg, Harry Wilson 1908

Lancaster.

Frailey, William Otterbein 1903
Heinitsh, Sigmund William 1889
Shaub, Jacob Raymond 1908

Latrobe.

Livengood, Daniel Webster 1909

Lebanon.

Lemberger, Joseph Lyon 1858

Lincoln Place.

Moore, Ida Louise 1909

Lititz.

Moyer, Lewis Nathan 1903

Manheim, Lancaster Co.

Ruhl, Harry Fry 1902

Mars.

Willets, Charles Ellsworth 1905

McKees Rocks.

Sandles, Van Amburg 1909

Meadville.

Utech, Philip Henry 1907

Media.

Meeker, George Herbert 1905

Mt. Joy, Lancaster Co.

Garber, Elmer Franklin Weaver..1901

New Castle.

Douglas, Austin Earl 1908
Wallace, John Crawford 1905

Norristown.

Reed, Willoughby Henry 1893

Ogontz.

Clayton, Abram Theophilus 1906

Oil City.

Barber, Harriett A. 1909
Gaddess, John 1908
Gaddess, Thomas 1908

Philadelphia.

Apple, Franklin Muhlenberg 1905
Baer, Jacob Michael 1902
Bauer, Louis Gustavus 1867
Blackwood, Russell Thorn 1907
Blair, Henry Cowan 1907
Becker, Maxwell Montefiore 1909
Borell, Henry Augustus 1874
Boring, Edward McCurdy 1867
Bradshaw, Henry A. 1908
Brinton, Clement Starr 1907
Burg, John Dellinger 1888
Burke, William Thompson 1906
Busch, Miers 1903
Cadmus, Robert Clark 1906
Campbell, Milton 1902
Campbell, Theodore 1902
Clapham, Hesser Charles 1907
Cliffe, William Lincoln 1898
Conover, Samuel Harry 1908
Cook, Ernest Fullerton 1901
Cope, Frank Henry 1909
Crawford, Joseph 1903
Cuthbert, Richard William 1906
Decker, William Robert 1907
Ellis, Evan Tyson 1857
England, Joseph Winters 1893
Evans, George Bryan 1902
Feidt, George David 1898
Fox, Peter Paul 1869
French, Harry Banks 1890
French, Howard Barclay 1906
Gabell, Cromwell Pearce 1907
Gano, William Hubbell 1892
Garvey, James Aloysius 1909
Githens, Thomas Stotesbury 1909
Goldberg, Joseph 1908
Goodhart, Brua Clifford 1909

Graham, Willard 1902
Greenawalt, William Grant 1907
Hance, Anthony Miskey 1902
Hance, Edward Hance **1857**
Harbold, Curtis Alexander 1907
Harbold, John Tilden 1905
Hassinger, Samuel Ellphat Reed . 1880
Haussmann, Frederick William .. 1895
Haydock, Susannah Garrigues ... 1905
Heim, William Joseph 1902
Heintzelman, Joseph Augustus. ... 1858
Henry, Samuel Clements 1909
High, Raymond Lightcap 1902
Hoch, Aquilla 1896
Hoch, Quintus 1907
Hughes, Francis Stacker 1902
Hunsberger, Ambrose 1905
Kahn, Solomon Karl 1905
Kercher, Edwin Harry 1907
Kimberly, Charles Hubbell 1908
Kirby, Charles P. 1909
Kirk, Frank Hall 1907
Kirk, Samuel Bird 1907
Kline, Clarence Mahlon 1902
Koch, Christopher 1907
Kraemer, Henry **1892**
Kraus, Otto 1906
Lacey, William Henry 1907
Lackey, Richard Henry 1907
Lantz, William Henry 1908
LaWall, Charles Herbert 1896
LaWall, Millicent Renshaw (Mrs.) 1905
Lee, William Estell 1905
Leedom, Charles 1902
Long, John Nathan Grier 1906
Lowe, Clement Belton 1895
Marsden, Joshua Eugene 1906
Martin, Harry 1908
Matusow, Harry 1897
McCartney, Frank Stewart 1908
McConomy, Paul Lucien 1906
McFerren, Jeremiah Dull 1906
McIntyre, William **1868**
McNeil, Robert 1907
Mellor, Alfred 1864
Miller, Adolphus William **1868**
Minehart, John Roy 1905
Moerk, Frank Xavier 1898
Monaghan, Thomas Francis 1902
Morgan, Frank E. 1906
Morris, Lemuel Iorwerth **1880**
Mulford, Henry Kendall 1896
Nebig, William George 1907
Oliver, Frank Murphy 1906
Osterlund, Otto William 1902
Ottinger, James Jeremiah 1876
Pachili, Theodore, Jr. 1907
Peacock, Bertha Leon (Mrs.) 1895
Peacock, Josiah Comegys 1892
Pearson, William Alexander 1908
Pile, Gustavus 1881
Poley, Warren Henry 1906
Pollard, Augustus Torrey 1906
Rauff, U. Gilbert 1907
Rehfuss, Charles 1908
Remington, Joseph Price **1867**
Riegel, Samuel Jacob 1905
Roach, Jeremiah Thomas 1907
Rosengarten, George David 1902
Sadtler, Samuel Philip 1893
Shafer, Erwin Clement 1893
Shoemaker, Clayton French 1902
Shoemaker, Richard Martin **1865**
Siegfried, Howard J. 1907
Smith, Albert Henry 1902
Smith, Walter Valentine 1902
Stanislaus, Ignatius Valerius Stanley 1906
Staudt, Albert John 1907
Stewart, Francis Edward 1884
Streeper, Frank Park 1907
Stroup, Freeman Preston 1900
Thum, John Karl 1905
Turner, Joseph L. 1906
Warner, William Richard, Jr. 1902
Weidemann, Charles Alexander ... **1868**
Weidemann, George Buzby 1902
Weisner, Nicholas Fredrick 1909
White, Robert Charles 1906
Wood, Horatio C., Jr. 1906

Pittsburg.

Aschman, F. T. 1909
Bell, William Ray 1906
Blank, Herman Gustave 1905
Blumenschein, Frederick John ... 1904
Bryson, William Smith 1905
Calhoun, Will N. 1908
Dahlin, Horace Otto 1905
Darbaker, L. K. 1909
Eiben, John Joseph 1909
Emanuel, Louis **1878**
Emanuel, Louis, Jr. 1909
Erskine, George Walker 1909
Evans, Harry Oliver Newton 1908

Fawcett, Charles Emerson 1905
Gleghorn, James Seymour 1900
Grauer, Norman Albert 1909
Hoechstetter, Max Sigmund 1908
Holsopple, J. Bert 1905
Horwitz, Leon 1909
Judd, Albert Floyd 1901
Koch, Julius Arnold 1892
Krassnosky, Samuel 1907
Kretz, Edward John 1909
MacMillin, Edward Watson 1909
McAdams, William J. 1908
Mierzwa, Richard 1908
Minor, Harry S. 1909
Moyer, Ray Paul 1907
Muchnic, Adolph Morris 1905
Patterson, Charles Meade 1905
Plough, William Henry 1908
Pritchard, Benjamin Elliott 1908
Rodemoyer, William Edward 1901
Saalbach, Carl 1908
Saalbach, Louis 1907
Schaefer, Charles Henry 1909
Schaefer, Emil August 1900
Scholz, William Frank 1908
Soult, Ray Mont 1905
Sialing, James 1909
Stiefel, Albert Frederick 1909
Thompson, John Reynolds 1905
Walter, Peter Grant 1905
Wurdack, John Herman 1909
Yellig, Daniel C. 1909

Pottsville.

Deibert, Thomas Irwin 1882

Reading.

Ziegler, Howard Philip 1905
Ziegler, Philip Milton 1867

Scranton.

Davis, Emma May 1905
Knoepfel, William Henry 1909
Thomas, Daniel Judson 1905

Sewickley.

Minesinger, Norman Wilhelm 1906

Sharpsburg.

Stech, George Oscar, Jr. 1908

Swissvale.

Johnson, Ralph Henry 1901

Towanda.

Porter, Henry Carroll 1872

Warminster.

Oetinger, Albert 1902

Washington.

McConaughy, Thomas Singleton .1905
Minton, Charles Newton 1908
Vowell, Lewis Sweitzer 1905

Wilkinsburg.

Beacom, C. Edwin 1909
Berg, Albert Leonard 1908
Toner, Robert Thomas 1908

Williamsport.

Cornell, Edward Augustus 1873
Millener, William S. 1905
Smith, Edward W. 1902
Walton, Lucius Leedom 1904

York.

Leber, Jacob Gilbert 1905
Patton, John Franklin 1880

PHILIPPINE ISLANDS.

Benguet.

Hamner, James Faris 1906

Canacao.

Miller, Charles Elliott 1899

Manila.

Comfort, Newton C. 1904
Guerrero, Leon Maria 1904
Zamora, Manuel 1908

RHODE ISLAND.

Narragansett Pier.

Davis, Peter B. 1909

Newport.

Downing, Benjamin Franklin 1886
Kalkman, Henry Alfred 1907
Pearson, Joseph Frederick 1897
Wood, John William 1897

Pawtucket.

Brennan, James Edward 1909
Morgan, George Smith 1909

Providence.

Anthony, Edwin Perkins 1909

Blanding, William Oliver 1894
Colton, Edward Thomas 1909
Fairbanks, George Edwin Barrows 1909
Greene, William Ray 1883
Haynes, Herbert 1908
O'Hare, James 1888
Pearce, Howard Anthony 1894
Strickland, Franklin Nelson 1905

Woonsocket.

Jackson, Frank Anthony 1900

SOUTH CAROLINA.

Blacksburg.

Bell, Elwood Fisher 1909

Charleston.

Hyde, Joseph Bell, Jr. 1909

SOUTH DAKOTA.

Brookings.

Whitehead, Bower Thomas 1908

Conde.

Ross, Otto Ellsworth 1908

Dell Rapids.

Bent, Edward Clarence 1905

Geddes.

Pinaud, Pierre Romeo 1908

Lake Preston.

Keith, Irwin Alonzo 1906

Redfield.

Swartz, George Fisher 1909

Sioux Falls.

Dunning, Lyman Taylor 1906

Springfield.

Kress, Horace 1908

Tyndall.

Cotton, Robert. M. 1908

Watertown.

Jones, David Franklin 1895

Yankton.

Brecht, Frederick Adolph 1895
Wallhann, Carl G. 1907

TENNESSEE.

Bristol.

Brashear, Owen Lee 1906

Chattanooga.

Voigt, Joseph Frederick 1893

Jackson.

Nance, Oscar Jones 1909

Knoxville.

Rosenthal, David Abraham 1894

Memphis.

Duntze, Francis Clarke, Jr. 1908
Mayo, Frederick William 1909
McBride, Charles Robert 1904
Robinson, James Scott **1869**
Sheehan, John S. 1907
Ward, Francis Watson 1908
Wilkes, George Redford 1907

Nashville.

Burge, James Oscar **1878**
Clark, Ira Burton 1909
Eves, Robert Lee 1909
Holt, Lewis Herbert, Jr. 1907
McGill, John Thomas 1900
Neil, Dallas Hardee 1909
Ruddiman, Edsel Alexander 1894
Trolinger, Ernest Franklin 1909
White, William Rufus 1904

Sharon.

Shannon, Thomas J. 1905

TEXAS.

Austin.

Jackson, Hugh Cyrus 1909

Beaumont.

Vredenburgh, Bruce 1909

Brownsville.

Willman, William George 1904

Burnet.

Knox, Robert James 1909

Clifton.

Brooks, James Mordecai 1909

Cooper.

Snell, Thomas Jefferson 1909

Corpus Christi.

Wilson, Talvus DeWitt 1909

Corsicana.

Coulson, James Thomas 1906
McDaniel, John Preuit 1908

Dallas.

Cormick, John William 1906
De Lorenzi, Albert 1890
Duncan, Chester Arthur 1906
Eberle, Eugene Gustavus 1896
Golaz, Ernest Henry 1907
Hickox, Milton 1909
Schrodt, Jacob 1903

Denton.

Allison, Samuel Porter 1905

Detroit.

McGee, George 1907

El Paso.

Hunter, Angus 1906
Mayes, Joseph Allen 1909
Ryan, Ambrose Eugene 1907
Ward, Herbert 1909
Weaber, John Alvin 1906

Elgin.

Deener, Richard Simpson 1909

Ennis.

Glover, Ethridge Emil 1909

Fort Worth.

Brashear, James Preston 1909
Coulson, Jack 1909
Covey, John Walker 1908
Needham, Robert Hamilton 1906

Galveston.

Buckner, John Clark 1905
Cline, Raoul Réné Daniel 1898
Orton, Ingomar François 1891
Turk, Bascom Andrew 1908

Gonzales.

Robertson, William Franklin 1907
Walker, Robert Hamilton 1907

Hallettsville.

Saccar, Michael 1905

Houston.

Burgheim, Jacob 1892
Heaton, John Charlton 1909

Hughes Springs.

Glass, William Finis 1904

Munday.

Cousins, Walter Henry 1909

New Braunfels.

Voelcker, Edwin Bruno 1908

Paris.

Musselman, Claude J. 1906

San Antonio.

Nester, Herman August 1909
Schaefer, Laura 1909

Saint Jo.

Pedigo, Smith Christopher 1907

Troupe.

McKay, Felix Early 1903

Velasco.

Roeller, Edward Frank 1902

Waelder, Gonzales Co.

Brookes, Virginia Cade 1901

Waxahachie.

Fearis, Burvadis Whipple 1909

UTAH.

Brigham.

Eddy, Wynn Leland 1908

Cedar City.

Bladen, John Mount 1908

Manti.

Cahoon, Shirley 1909

Ogden.

Culley, John 1908

Provo City.

Hedquist, Alexander 1908
Hedquist, Francis J. 1908
Sutton, Arthur D. 1908

Salt Lake City.

Coffman, Walter Thomas 1904
Dayton, Walter Henry 1908

Druehl, Frank August 1908
Halliday, Thomas Law 1908
Harms, Herman E. 1908
Harvey, Charles Julian 1908
Irvine, Darwin William 1902
Johnson, Joy Happy 1908
Nelden, Ralph 1908
Peters, Otto Rudolph 1908
Schramm, Frederick Clement 1908
Van Dyke, Charles 1908
Whitworth, Frank Edgar 1908

Smithfield.

Colpin, Emanuel Edward 1907

VERMONT.

Barre.

Davis, Daniel Frost 1907

Barton.

Pierce, Fred Sutton 1909

Burlington.

Parker, Frank Henry 1909
Zottman, William Henry 1903

Marshfield.

Gilman, Elbridge Wheeler 1907

Montpelier.

Slade, Henry Allen 1899
Terrill, Willis Ethel 1899

Morrisville.

Cheney, Arthur Lewis 1907

Orleans.

Austin, Arthur Orlo 1909

St. Johnsbury.

Bingham, Charles Calvin 1875

Vergennes.

Warner, William Russell 1909

VIRGINIA.

Barton Heights.

Miller, Roshier W. 1906

Bedford City.

Roadcap, Silas M. 1908

Big Stone Gap.

Myers, George B. 1909

Charlotte C. H.

Williams, Walter Gregory 1905

Culpeper.

Goldsborough, Charles Henry 1898

Falls Church.

Mankin, George Tyree 1909

Harrisonburg.

Avis, James Little 1905

Lynchburg.

Craighill, Edward Addison 1909
Fleet, Charles B. 1909
Hamner, Edward Chambers 1909

Martinsville.

Kearfoot, Clarence Piercall 1908

Norfolk.

Martin, William Rogers 1905
Nelligar, Frederic Dennis 1907

Phoebus.

Congdon, George Gardner 1903

Richmond.

Bolenhaugh, Albert 1909
Brandis, Ernest Linwood 1906
Briggs, Andrew Gessner 1890
Curd, Thomas Nelson 1907
Harrison, Robert Lucius 1900
Miller, Turner Ashby 1894

Roanoke.

Barnes, Henry Cooper 1905
Johnson, John Chilton 1909

Suffolk.

Hall, Joseph Patten 1900

WASHINGTON.

Chehalis.

Prigmore, George Daniel 1909

Kahlotus.

Dougherty, Edwin R. 1909

La Conner, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus 1889

Port Townsend.

Kliemand, George 1907
Rogers, Edward 1902
Rutz, Walter 1908

Pullman.

Watt, George Henry 1896

Puyallup.

Truedson, Eric Per 1904

Seattle.

Aschermann, Gustav Singer 1905
Bivins, Elliott A. 1909
Blalock, Jesse Nelson 1909
Block, Anthony E. 1909
Dewey, Albert Haskin 1909
Guy, George Omar 1908
Holmes, Henry Elliott 1880
Johnson, Charles Willis 1903
Kurtz, William Berthold 1909
Maurer, Henry C. 1909
McCaughan, John Harold 1908
Osseward, Cornelius 1897
Rubenstein, Louis 1909
Steyh, George Philip 1907
Vaughn, Patrick Henry 1907
Watson, Joseph Ryerson 1904
West, Benjamin Franklin 1909
Workman, Robert 1909

Snohomish.

Wilbur, Lot 1896

Spokane.

McArthur, James W. 1904

Tacoma.

Jensen, Peder 1909
Kent, Nich. Gardner 1909
Walker, Charles Henry 1904

Wilbur.

Bandy, George 1905

WEST VIRGINIA.

Bluefield.

Goodykoontz, Charles Henry 1909
Schulze, Edward Charles 1909

Buckhannon.

Young, George Orvill 1907

Clarksburg.

Haymaker, Frank Berkshire 1906

Harpers Ferry.

Dittmeyer, Walter Eugene 1907

Hinton.

Rose, Shannon Samuel 1909

Majorsville.

Dinsmore, Warren 1908

Martinsburg.

Brown, Edward Preston 1906

Pine Grove.

Morgan, Thomas Lee 1907

Sutton.

Walker, Alfred 1905

Wheeling.

Coleman, John 1905
Dawson, Edward Bruce 1907
Gordon, Wm. C. 1905

Weston.

Levier, Oscar H. 1908

WISCONSIN.

Eau Claire.

Boberg, Otto Johan Sinius 1903

La Crosse.

Beyschlag, Charles 1880
Hebbard, Edward Smith 1907

Madison.

Fischer, Richard 1901
Kremers, Edward **1887**
Lewis, Henry 1908
Schulz, Raymond Louis 1907
Wakeman, Nellie Antoinette 1908
Williams, Edward 1906

Menomonie.

Puhl, Richard Herman 1908

Milwaukee.

Dadd, Robert Morrow 1896
Hill, Warren Brown 1908
Janssen, Jacob Solomon 1903
Kettler, Edward, Jr. 1896
Krembs, Ernest Maximilian 1903
Raeuber, Edward Gottfried 1900
Ruenzel, Henry Gottlieb 1892
Russell, Hugh C. 1909
Schranck, Charles Henry 1876
Seyfert, Paul 1909
Sommer, Richard Ernst Wilhelm.1909
Spiegel, Adolph 1905

Neillsville.
Sniteman, Charles Clarence 1881

Oconomowoc.
Peters, Henry August 1903

Racine.
Horlick, Alexander James 1904
Kradwell, Gustav A. 1908

Reedsburg, Sank Co.
Mueller, Frank Frederick 1909

Richland Center.
Allen, Huestus Benjamin 1908

Watertown.
Eberle, Arthur Ralph 1907
Eberle, Herman Theodore 1901

Wausau.
Albers, William W. 1909

DOMINION OF CANADA.

MANITOBA.

Winnepeg.
Bletcher, Henry Ernest John 1904

NEW BRUNSWICK.

St. John.
Paddock, Morris Venner 1902

NOVA SCOTIA.

Halifax.
Simson, Francis Cook 1876

ONTARIO.

Guelph.
Stewart, Alexander 1905

Ottawa.
Saunders, William 1860

Stratford.
Waugh, George James 1862

Toronto.
Heebner, Charles Frederick 1894

QUEBEC.

Montreal.
Morrison, Joseph Edward 1888

Quebec.
Willis, Henry 1897

Three Rivers.
Williams, John Lewis 1909

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Abreu, Gerardo Fernandez, Havana, Cuba 1907
Alacán, José Práxedes, Havana, Cuba 1907
Biosca, Placido, Havana, Cuba 1907
Bosque, Arturo, Havana, Cuba 1907
Capote, José, Havana, Cuba 1907
Cartaya, Julio Hernandéz, Havana, Cuba 1907
Cuervo, Adolfo, Havana, Cuba 1907
Curquejo, Antonio Gonzales, Havana, Cuba.....1907
De Jongh, Pedro, Cardenas, Cuba 1907
Diaz, José Guillermo, Havana, Cuba 1907
Fanous, Amin, Fayoum, Egypt 1907
Hallaway, Robert Railton, Carlisle, England.....1905
Herrera, Francisco, Havana, Cuba 1907
Heyl, James Bell, Hamilton, Bermuda 1863
Jacobs, Charles Christian, Havana, Cuba 1901
Johnson, Manuel, Havana, Cuba 1907
Ladakis, Triantaphyllo, Beirût, Syria 1907

Martin, Nicholas Henry, Gateshead-on-Tyne, England 1891
Martinez, Alfred, Havana, Cuba 1907
Mata y Acosta, Joaquin, Havana, Cuba 1907
Morales, Celestino Garcia, Havana, Cuba 1907
Moya, Carlos A., Havana Cuba 1907
Murray, Alexander, San José de Costa Rica 1903
Padron, Thomas, Havana, Cuba 1907
Patch, James Alfred, Beirût, Syria 1903
Pedrosa, Manuel, Havana, Cuba 1907
Pirie, Alfred Mitchell, Cartago, Costa Rica 1903
Power, Frederick Belding, London, England 1872
Puig, Juan E., Havana, Cuba 1907
Sarra, Ernesto, Havana, Cuba 1907
Taquechel, Francisco, Havana, Cuba 1908
Valdes Eduardo, Matanzas, Cuba 1907
Wellcome, Henry Solomon, London, England 1875
Zeledon C., Jose Antonio, Limon, Costa Rica 1909

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Bernström, Nils Gustaf 1906
Boulton, Emison Allen 1902
Cajulis y Samedra, Felix 1907
Collins, Mary Elizabeth 1902
Dow, John Cameron 1907
Dulaney, Joseph Field 1902
Eppstein, Jacob 1902
Figueroa, E. V. 1907
Graham, Karl Harris 1907
Perdue, William Louis 1907
Reid, William W. 1906
Schaffer, Charles 1903
Schneider, Benjamin 1907
Stromberg, Eric W. 1908
Thompson, Mason L. 1908
Young, Harry Garfield 1908

Note.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings, 1900, p. 18.)

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, F. R. S., Watford, England.
Carteighe, Michael, F. I. C., 180 New Bond St., London, W., England.
Holmes, E. M., F. L. S., 17 Bloomsbury Square, London, W. C., England.
Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.
Schaer, Dr. Edward, Professor of Pharmacy, Pharmaceutisches Institut der Universität, Strassburg, Germany.
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

Abbett, Wm. A.,
201 W. Superior st., Duluth, Minn.
Abernethy, John C.,
c. o. Biscayne Drug Co., Miami, Fla.
Abernethy, Maxwell,
22 Brinkerhoff st., Jersey City, N. J.
Abreu, Gerardo F.,
103 San Miguel st., Havana, Cuba.
Ackerman, Philip J.,
549 N. High st., Columbus, O.
Ackermann, Albert G.,
4701 Cottage Grove ave., Chicago, Ill.
Adamick, Gustave H.,
189 E. Madison st., Chicago, Ill.
Adams, Arthur E.,
16 Westlake ave., Auburn, N. Y.
Adams, James H.,
Box 164, Sagamore, Mass.
Adams, James O.,
1637 Second st., New Orleans, La.
Ade, Daniel A.,
109 Randolph st., Chicago, Ill.
Alacán, José P.,
21 17th st., Vedado, Havana, Cuba.
Albers, William W.,
501 LaSalle st., Wausau, Wis.
Alkire, Lewis,
1596 S. Pearl st., Denver, Colo.
Allen, Alonzo W.,
16th & Marshall sts., Portland, Ore.
Allen, Andrew C.,
40 Depot st., Ashtabula, O.
Allen, Bertram,
Clearwater Pharm., Clearwater, Fla.
Allen, E. Floyd,
1538 Nicollet ave., Minneapolis, Minn.
Allen, Huestus B.,
Richland Center, Wis.
Allen, William A.,
Musgrove Block, Andover, Mass.
Allen, William E.,
Monroe, La.
Allison, Samuel P.,
Denton, Tex.
Allison, William O.,
100 William st., New York, N. Y.
Alpers, William C.,
495 Columbus ave., New York, N. Y.
Amos, Wilber S.,
7th & Central sts., Kansas City, Mo.
Anderson, Carl G.,
1336 E. Belmont ave., Chicago, Ill.
Anderson, William C.,
320 Lafayette ave., Brooklyn, N. Y.
Andreen, Carl,
1504 4th st., Sioux City, Ia.
Andrews, George M.,
9 & 11 N. Main st., Woodstown, N. J.
Andrews, William A. P.,
172 Church st., West Haven, Conn.
Anewalt, Ellsworth Q.,
140 S. Main st., Phillipsburg, N. J.
Angell, James R.,
2300 Baronne st., New Orleans, La.
Anglum, John,
1463 Larimer st., Denver, Colo.
Anspach, Paul B.,
334-336 Northampton st., Easton, Pa.
Anthony, Edwin P.,
178 Angell st., Providence, R. I.
Apmeyer, Chas. A.,
cor. Sixth & Vine sts., Cincinnati, O.
Apple, Franklin M.,
cor. 31st & Berks st., Philadelphia, Pa.
Appleton, William R.,
Lock Box 162, Warren, Ark.

Arkin, James A.,
1661 Haight st., San Francisco, Cal.
Armour, Elmer E.,
294 Holt ave., Pomona, Cal.
Arneson, Thomas,
Lock Box 21, Kennedy, Minn.
Arnold, Wm. C.,
Houtzdale, Pa.
Arny, Harry V.,
356 Superior st., Cleveland, O.
Aschermann, Gustav S.,
University Station, Seattle, Wash.
Aschman, F. T.,
608 McCance Block, Pittsburgh, Pa.
Asher, Philip,
725 Camp st., New Orleans, La.
Ashim, Barach J.,
610 Third st., San Francisco, Cal.
Atkins, Chas. W.,
Petoskey, Mich.
Austin, Arthur O.,
P. O. Block, Main st., Orleans, Vt.
Avery, Charles H.,
302 E. 55th st., Chicago, Ill.
Averyt, Henry M.,
426 Baldwin ave., Detroit, Mich.
Avis, James L.,
83 S. Main st., Harrisonburg, Va.
Axness, Ole M.,
Pelican Rapids, Otter Tail Co., Minn.
Ayres, Albert J.,
153 W. 103d st., New York, N. Y.
Ayres, Gold,
England, Ark.
Babcock, Percival W.,
71 Lisbon st., Lewiston, Me.
Bachelle, Rudolph von,
130 E. 43d st., Chicago, Ill.
Bachman, Gustav,
Coll. Pharm., Minneapolis, Minn.
Bacon, Ephraim,
Calvert & 30th sts., Baltimore, Md.
Baer, Edward A.,
722 Market st., San Francisco, Cal.
Baer, Jacob M.,
2000 Chestnut st., Philadelphia, Pa.
Baigent, John T.,
Hosp. Colum. Barracks, Columbus, O.
Bailey, Frederick,
P. O. Box 314, Lowell, Mass.
Baily, G. Frank,
28 S. Hanover st., Baltimore, Md.
Baird, Julian W.,
102 St. Botolph st., Boston, Mass.
Baker, De Forest,
300 E. 43d st., Kansas City, Mo.
Baker, Edwin,
Bridge st., Shelburne Falls, Mass.
Baker, Walter N.,
400 Neponset ave., Boston, Mass.
Baldauf, Julius L.,
214 Main st., Henderson, Ky.
Baldwin, Edward L.,
20 Market st., San Francisco, Cal.
Ballagh, Wilfred T.,
S. E. cor. Square, Nevada, Mo.
Ballard, Chas. W.,
115 W. 68th st., New York, N. Y.
Ballard, John W.,
106 W. 2d st., Davenport, Ia.
Ballou, Clarence O.,
117 N. 8th st., Boise, Idaho.
Balmert, Clemens A.,
308 W. Lombard st., Baltimore, Md.
Balser, Gustavus,
137 Avenue B, New York, N. Y.
Baltar, Joseph T.,
470 Jackson ave., New Orleans, La.
Baltzly, Albert B.,
2560 Broadway, New York, N. Y.
Baltzly, Zachariah T.,
12 Erie st., Massillon, O.
Bancroft, Richard B.,
310 Central ave., Hot Springs, Ark.
Bandy, George,
Wilbur, Wash.
Bandy, Lewis A.,
Homestead, Pa.
Bange, Otto F.,
cor. 11th & German sts., Newport, Ky.
Banks, Walter C.,
c. o. Banks Drug Co., Riverside, Cal.
Bard, Wm. E.,
108 W. Main st., Sedalia, Mo.
Barnard, Harry A.,
171 Main st., Marlboro, Mass.
Barnes, Chas. D.,
808 Grand av., Glenwood Springs, Colo.
Barnes, Henry C.,
2 S. Jefferson st., Roanoke, Va.
Barnett, Joel J.,
c. o. Sharp & Dohme, Baltimore, Md.
Barrett, Chas. L.,
Broadway & Line st., Camden, N. J.

Bartells, George C.,
130 East State st., Camp Point, Ill.
Bartlett, James E.,
50 Franklin st., Chicago, Ill.
Bartlett, N. Gray,
22d st. & Indiana ave., Chicago, Ill.
Bartley, Elias H.,
65 S. Portland av., Brooklyn, N. Y.
Base, Daniel,
329 N. Schroeder st., Baltimore, Md.
Baskette, Frank E.,
156 B st., San Mateo, Cal.
Bassett, Charles H.,
109 Arch st., Boston, Mass.
Bastian, Otto C.,
129 W. Washington st., S. Bend, Ind.
Basye, Taylor C.,
323 Main st., Rockport, Ind.
Bate, Henry J.,
404 E. 43d st., Chicago, Ill.
Bateman, Herbert H.,
Cooperstown, N. Dak.
Battles, Wilton L.,
426 Malvern ave., Hot Springs, Ark.
Bauer, Louis G.,
261 High st., Germant'n, Phila., Pa.
Baughman, Leo M.,
1920 New England av., Los Angeles, Cal.
Baumann, Oscar,
102 E. 3d st., Grand Island, Neb.
Baur, Jacob,
76 Illinois st., Chicago, Ill.
Bayly, Charles A.,
1400 Devisadero st., San Francisco, Cal.
Beacom, C. Edwin,
804 Penn ave., Wilkinsburg, Pa.
Beane, Chester H.,
193 Water st., Gardiner, Me.
Beal, George D.,
Scio, O.
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Hepburn, John,
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Herrera, Francisco,
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Hickox, Milton,
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Hoch, Aquila,
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Hoch, Quintus,
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Hodgson, Joseph A.,
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Hodson, Daniel F.,
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Hodson, Eugene W.,
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Hoechstetter, Max S.,
31 McClure av., N. S., Pittsburg, Pa.
Hoffmann, George F.,
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Hoffman, George L.,
321 Fourth st., Logansport, Ind.
Hoffman, Geo. W.,
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Holt, Lewis H., Jr.,
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Holzhauer, Charles,
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Horton, Charles H.,
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Hunt, Reid,
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Jackson, Hugh C.,
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Johnson, John C.,
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Johnson, Joy H.,
80 W. 2nd South st., Salt Lake, Utah.

Johnson, Lewis,
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Johnson, Manuel,
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Johnson, Ralph H.,
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Jones, James T.,
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Jones, Mervin A.,
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Jones, Oscar W.,
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Jones, Simon N.,
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Kaufman, Reuben M.,
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Kelley, Chas. S.,
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Rauff, U. Gilbert,
6th & Thompson sts., Philadelphia, Pa.
Rauschenberg, Sidney,
29 S. 12th ave., Mt. Vernon, N. Y.
Rauschkolb, John,
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Reyer, Emil,
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Rice, Thaddeus B.,
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Ricen, Joseph M.,
315 First st., Portland, Ore.
Rich, Stanley H.,
394 Sixth st., Portland, Ore.
Rich, W. Pitt,
Grove ave., Verona, Essex Co., N. J.
Richardson, Frank,
Cambridge, N. Y.
Richardson, Horatio S.,
Main st., Concord, Mass.
Richardson, Samuel W.,
2185 Main st., Buffalo, N. Y.
Richardson, Willard S.,
316 4½ st. S.W., Washington, D. C.
Richtmann, William O.,
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Riddell, Benjamin F.,
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Ring, William A.,
High Point, N. C.
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Robinson, William J. M.,
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Roe, John T.,
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Rogers, Edward,
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Rogers, Ora L.,
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Rogers, Russell V.,
Main & Akard sts., Dallas, Tex.
Rogers, William H.,
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Rohr, Arthur von
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Rommel, Hans C.,
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Rose, Edward S.,
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Ruddiman, Edsel A.,
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Russell, Hamilton,
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Samson, Max,
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Sarra, Ernesto,
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Sawyer, Hilon H.,
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Scherling, Gustav,
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Schleussner, Chas. F.,
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Schlosser, Peter,
124 W. Chestnut st., Louisville, Ky.
Schlotterbeck, Augustus G.,
36 Brown st., Portland, Me.
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Schoenhut, Christie H.,
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Schranck, Henry C.,
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Schreiner, Robert,
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Schrodt, Jacob,
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Schroeter, Herman M.,
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Schueller, Frederick W.,
232 S. High st., Columbus, O.
Schuh, Paul G.,
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Schulte, Alex., Jr.,
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Schultz, John J.,
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Schulz, Henry L.,
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Schulz, Raymond, L.,
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Scott, Clarence A.,
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Scott, Edgar B.,
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Scott, Harry,
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Scott, William C. M.,
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Scoville, Wilbur L.,
73 Brainard st., Detroit, Mich.
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56 Smith st., Perth Amboy, N. J.
Sears, Charles B.,
109 Genesee st., Auburn, N. Y.
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Seely, Anton H.,
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Seidell, Atherton,
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Smith, Frank M.,
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Smith, Guy L.,
Front st., Douglas, Alaska.
Smith, Harley E.,
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Smith, Joseph G.,
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Smith, Lauriston S.,
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Smith, L. Grant,
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Smith, Linville H.,
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Swain, Robert L.,
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224 Ouachita av., Hot Springs, Ark.
Taylor, Chas. D.,
Pass Christian, Miss.
Taylor, George E.,
Denver, Colo.
Taylor, Henry L.,
2 Woodlawn av., Albany, N. Y.
Taylor, Milton M.,
245 Plant ave., Tampa, Fla.
Taylor, Walter T.,
Morgan Hill, Cal.
Teeters, Wilber J.,
Iowa Coll. Pharm., Iowa City, Ia.
Terrill, Willis E.,
9 State st., Montpelier, Vt.
Thebus, William F.,
1101 16th st., Denver, Colo.
Thelander, Creston C.,
921 4th st., Sioux City, Ia.
Thomas, Daniel J.,
345 Wyoming ave., Scranton, Pa.
Thomas, Frank G.,
111 N. Front st., Mankato, Minn.
Thomas, John B.,
Baltimore & Light sts., Baltimore, Md.
Thomas, Oscar B.,
101 E. Baltimore st., Baltimore, Md.
Thomas, Robert, Jr.,
108 Broad st., Thomasville, Ga.
Thompson, Albert D.,
1st av. S. & 3d st., Minneapolis, Minn.
Thompson, Frank A.,
502 Trombley ave., Detroit, Mich.
Thompson, Jno. R.,
315 Smithfield st., Pittsburg, Pa.
Thompson, Leon A.,
278 Dartmouth st., Boston, Mass.
Thompson, Mason L.,
Residence Unknown.
Thorburn, Albert D.,
316 E. 33rd st., Indianapolis, Ind.
Thorn, Henry P.,
Main st., Medford, N. J.
Thornhill, Sewell,
Sayville, N. Y.
Thorp, Edmund,
1410 Davenport st., Omaha, Neb.
Thum, John K.,
c. o. German Hospital, Phila., Pa.
Thurston, Azor,
Grand Rapids, Wood Co., O.
Thurston, Edwin J.,
Mobile Quarantine, Ft. Morgan, Ala.
Tielke, Maxwell G.,
474 Detroit st., Cleveland, O.
Tilley, Robert B.,
9th st. & Broadway, Columbia, Mo.
Tilton, Claude E.,
Fairmount, Ill.
Timmermann, Richard H.,
600 Park ave., New York, N. Y.
Timmons, George D.,
458 Greenwich st., Valparaiso, Ind.
Tobey, Chas. W.,
Troy, O.

Tobriner, Isaac,
Oakland, Cal.
Tocco, Orazio,
271 3d ave., Brooklyn, N. Y.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Toner, Robt. T.,
1110 Wood st., Wilkinsburg, Pa.
Topping, Arthur E.,
Overbrook, Kan.
Toulson, Milbourne A.,
Chestertown, Md.
Tracy, Kenneth W.,
103 Centre st., Ashtabula, O.
Traynor, Charles F.,
159 Maine st., Biddeford, Me.
Treat, Joseph A.,
Stuart, Guthrie Co., Ia.
Treber, Frederick W.,
301 W. Broadway, Louisville, Ky.
Tripp, Arthur H.,
573 Talbot av., Dorchester Center, Mass.
Trolinger, Ernest F.,
837 Second ave., S. Nashville, Tenn.
Troxler, Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
Troxler, Robert F.,
U.S.P.H.&M.H.S., Evansville, Ind.
Truax, Charles,
42 Wabash ave., Chicago, Ill.
True, Rodney H.,
U.S. Dept. Agriculture, Wash'ton, D.C.
Truedson, Eric P.,
Puyallup, Wash.
Truitt, Ernest A.,
Middletown, Del.
Turk, Bascom A.,
928 Church st., Galveston, Tex.
Turner, Edgar R.,
Upton Ky.
Turner, Joseph L.,
416 S. 13th st., Philadelphia, Pa.
Tuthill, Frederick P.,
526 Putnam ave., Brooklyn, N. Y.
Tuttle, George O.,
387 Congress st., Portland, Me.
Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
Umenhofer, Adolph,
1100 N. Halsted st., Chicago, Ill.
Utech, P. Henry,
209 Chestnut st., Meadville, Pa.
Valdes, Eduardo,
49 Constitucion st., Matanzas, Cuba.
Van Aller, Thomas S.,
210 S. Broad st., Mobile, Ala.
Van Antwerp, James C.,
250 State st., Mobile, Ala.
Van Derveer, Robert H.,
Broad&Monmouth sts., Red Bank, N.J.
Van Dyke, Charles,
3d South & Main st., Salt Lake, Utah.
Van Ness, George I.,
U.S.P.H.&M.H.S., Ft. Stanton, N. Mex.
Van Schaack, Cornelius P.,
138 Lake st., Chicago, Ill.
Vance, W. Scott,
Forest, Miss.
Vanderkleed, Charles E.,
200 First ave., Collingswood, N. J.
Vargas, Jorge,
1120 Boylston st., Boston, Mass.
Varney, Edward F.,
1151 Broadway, Oakland, Cal.
Vaughan, Parry W.,
106 E. Main st., Durham, Orange Co., N.C.
Vaughn, Patrick H.,
101 Eastlake ave., Seattle, Wash.
Vernor, James,
33 Woodward ave., Detroit, Mich.
Villere, Rene L.,
1001 Esplanade av., New Orleans, La.
Voeckel, Henry G.,
801 Central av., Los Angeles, Cal.
Voelcker, Edwin B.,
New Braunfels, Tex.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
Voiss, Arcadius,
395 Wells st., Chicago, Ill.
Von Stein, John H.,
Upper Sandusky, O.
Voorhees, Harry B.,
901 Washington st., Easton, Pa.
Vordick, August H.,
Jefferson av.&Benton st., St. Louis, Mo.
Voss Edward, Jr.,
1201 Vine st., Cincinnati, O.
Votteler, William,
Shelby & Oak sts., Louisville, Ky.
Vowell, Louis S.,
62 S. Main st., Washington, Pa.
Vredenburgh, Bruce,
502 Pearl st., Beaumont, Tex.

Waddell, Minor T.,
1207 Ash st., Indianapolis, Ind.
Wagner, Arthur C.,
231 Belmont st., Everett, Mass.
Wagner, Louis,
Mountain View, Cal.
Wakeman, Nellie A. (Miss),
706 State st., Madison, Wis.
Walbrach, Arthur,
1200 15th st., Denver, Colo.
Walbridge, Cyrus P.,
4th & Market sts., St. Louis, Mo
Waldner, Paul J.,
Med.& Surg.,NavyDept.,Wash't'n,D.C.
Walker, Alfred,
Sutton, W. Va.
Walker, Chas. H.,
507 Division ave., Tacoma, Wash.
Walker, Elias R.,
201 Jefferson st., Huntsville, Ala.
Walker, Joseph P.,
Charity Hospital, New Orleans, La.
Walker, Robert,
756 Bank st., Waterbury, Conn.
Walker, Robert H.,
Gonzales, Tex.
Walker, William A.,
127 West Georgia st.,Indianapolis,Ind.
Wall, Otto A.,
4532 Virginia ave., St. Louis, Mo.
Wallace, John C.,
61 E. Washington st., New Castle, Pa.
Wallhann, Carl G.,
101 W. Third st., Yankton, S. D.
Walsdorf, Edw. H.,
Peters & Magazine, New Orleans, La.
Walter, Charles A.,
209 S. Austin ave., Oak Park, Ill.
Walter, Peter G.,
Chestnut & Liberty sts., Pittsburg, Pa.
Walton, Lucius L.,
50 W. Fourth st., Williamsport, Pa.
Walz, J. Lee,
Walbrook av. & 13th st., Balto., Md.
Ward, A. Jae,
107E.Pike'sPeakav.,Colo.Spr'gs,Colo.
Ward, Chas. H.,
41 N. Fair Oaks av., Pasadena, Cal.
Ward, Enoch J.,
Front st., Ellisville, Miss.
Ward, Francis W.,
15 S. Main st., Memphis, Tenn.
Ward, Herbert,
El Paso, Tex.
Ward, Homer B.,
Rowland, N. C.
Ware, Charles H.,
1930 Madison av., Baltimore, Md.
Ware, Clarence W.,
Abercrombie, N. Dak.
Warfield, James A.,
Washington, Guernsey Co., O.
Warn, William E.,
Lock Box 342 Keyport, N. J.
Warner, Francis D.,
137 E. Michigan st., New Carlisle, Ind.
Warner, Louis H.,
473 Franklin av., Brooklyn, N. Y.
Warner, William R.,
Main st., Vergennes, Vt.
Warner, William R., Jr.,
639 N. Broad st., Philadelphia, Pa.
Warren, Lee,
2703 Montana av., Billings, Mont.
Warren, Lewis E.,
1108 Garfield av., Chicago, Ill.
Warren, Robert A.,
Clarksville, Ark.
Washburn, Homer C.,
Norman, Okla.
Watkins, Charles W.,
227 S. Illinois st., Indianapolis, Ind.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Joseph R.,
330 18th ave., N., Seattle, Wash.
Watson, William, Jr.,
202 Genesee st., Utica, N. Y.
Watt, George H.,
Pullman, Wash.
Watters, Alexander J.,
266 E. Fifth st., Los Angeles, Cal.
Waugh, George J.,
Ontario st., Stratford, Ont., Can.
Weaber, John A.,
209 S. El Paso st., El Paso, Tex.
Weaver, Clarence A.,
973 Trumbull av., Detroit, Mich.
Webb, Edward N.,
277 E. 14th ave., Columbus, O.
Webb, John W.,
Main st., Stuttgart, Ark.
Webber, J. Le Roy,
277 Greene ave., Brooklyn, N. Y.

Weber, Don C.,
Arlington, Neb.
Webster, Lloyd H.,
North st., Grafton, Mass.
Weed, Nelson,
411 S. Front st., Mankato, Minn.
Weicker, Theodore,
78-80 Beekman st., New York, N.Y.
Weidemann, Charles A.,
2148 Green st., Philadelphia, Pa.
Weidemann, George B.,
2148 Green st., Philadelphia, Pa.
Weilbaecher, Frank E.,
6056 Hurst st., New Orleans, La.
Weimar, Henry,
122 Central ave., Hot Springs, Ark.
Weinstein, Abraham,
696 Union ave., New York, N. Y.
Weinstein, Joseph,
1391 Fifth ave., New York, N. Y.
Weiser, William P.,
501 Market st., Camden, N. J.
Weisner, Nicholas E.,
2349 Germantown, av., Phila., Pa.
Weiss, Conrad H.,
25 Monroe st., Anacostia, D. C.
Weiss, Emil O.,
794 6th ave., New York, N. Y.
Wellcome, Henry S.,
Snow Hill Bldgs., London E.C., Eng.
Weller, Frank P.,
755 8th st. S. E., Washington, D. C.
Wells, Jas. H.,
241 Fifth ave., Chicago, Ill.
Wendel, H. Edward,
Box 181, Sea Isle City, N. J.
Wendt, William C.,
366 S. 4th st., Columbus, O.
Wenzell, William T.,
U.S.Appraiser's Office,San Fran.,Cal.
Werckshagen, Otto,
258 W. Biddle st., Baltimore, Md.
Werner, Rudolf C.,
2592 Atlantic av., Brooklyn, N. Y.
Werner, Wm. F.,
2202 E. 10th st., Indianapolis, Ind.
Wescott, William C.,
Pacific&Delaware avs.,Atlantic Cy,N.J.
Wesner, Henry C.,
Windsor, Henry Co., Mo.
West, Benjamin F.,
4759 14th av., N.E., Seattle, Wash.
West, Charles A.,
14 Fulton st., Boston, Mass.
West, Fred.,
2489 Howard st., San Francisco, Cal.
Westby, Severs,
679 E. 3d st., St. Paul, Minn.
Westcott, James W.,
423 N. Charles st., Baltimore, Md.
Westfall, Paul,
Oklahoma City, Okla.
Wetterstroem, Theodore D.,
3935 Spring Grove av., Cincinnati, O.
Wheatcroft, John C.,
Grayville, Ill.
Wheeler, A. Alton,
270 Woodward ave., Detroit, Mich.
Wheeler, Carlton B.,
18 Main st., Hudson, Mass.
Wheeler, William D.,
Sharon, Mass.
Whelpley, Henry M.,
2342 Albion Place, St. Louis, Mo.
Whilden, Charles B.,
135 Stockton st., San Francisco, Cal.
Whipple, George H.,
Broad & Fayette sts., Bridgeton, N. J.
White, Albert J.,
Dalton, O.
White, Charles H.,
153 E. 51st st., New York, N. Y.
White, Joseph L.,
928 New York ave., Wash'ton, D. C.
White, Robert C.,
412 S. 13th st., Philadelphia, Pa.
White, Robin H.,
70 Main st., Mt. Sterling, Ky.
White, Wm. R.,
314 Hancock st., Nashville, Tenn.
Whitehead, Bowe T.,
Brookings, S. Dak.
Whitfield, Thomas,
240 Wabash ave., Chicago, Ill.
Whitney, David V.,
3722 E. 12th st., Kansas City, Mo.
Whittington, Wm. G.,
262 Central av., Hot Springs, Ark.
Whittle, Wm. A.,
308 W. Lombard st., Baltimore, Md.
Whitworth, Frank E.,
775 E. 2d South st., Salt Lake, Utah.
Whorton, Carl,
5th & Chestnut sts., Gadsden, Ala.

Wicarius, Max J.,
4861 Cudahy ave., Hawthorne, Ill.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Wicks, Otto,
1375 Myrtle ave., Brooklyn, N. Y.
Wilbert, Martin I.,
728 20th st. N.W., Washington, D. C.
Wilbur, Lot,
Ave C & 1st. st., Snohomish, Wash.
Wilcox, Levi,
22 Mitchell ave., Waterbury, Conn.
Wiley, Harvey W.,
Dept. of Agriculture, Wash'ton, D. C.
Wilkes, George R.,
Box 100, Memphis, Tenn.
Willard, Rowland,
131 E. Main st., Haddonfield, N. J.
Willenbrink, Chas. A.,
512 Pike st., Covington, Ky.
Willets, Charles E.,
Grand ave., Mars, Pa.
Williams, Edward,
1 West Main st., Madison, Wis.
Williams, George G.,
99 North st., Boston, Mass.
Williams, John K.,
391 Main st., Hartford. Conn.
Williams, John L.,
Three Rivers, Que., Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williams, Walter G.,
Charlotte C. H., Va.
Williamson, R. E. L.,
1401 N. Charles st., Baltimore, Md.
Williamson, Wylie P.,
63rd & Halsted sts., Chicago, Ill.
Willis, Henry,
4 St. John st., Quebec, Can.
Willman, Wm. G.,
Adams st., Brownsville, Tex.
Willson, George A.,
106 Branch st., Lowell, Mass.
Wilson, Benjamin O.,
46 Canal st., Boston, Mass.
Wilson, Charles F.,
200 E. 31st st., Chicago, Ill.
Wilson, Frederick H.,
82 Main st., Brunswick, Me.
Wilson, George B.,
833 W. 6th st., Los Angeles, Cal.
Wilson, George T.,
Bowling Green, Ky.
Wilson, Richard B.,
866 W. Adams st., Chicago, Ill.
Wilson, Talvus D.,
Corpus Christi, Tex.
Wilson, William H.,
781 Park ave., New York, N. Y.
Wimmer, Curt P.,
115 W. 68th st., New York, N. Y.
Winberg, Washington W.,
5100 Lake av., Chicago, Ill.
Wingo, Daniel M.,
3rd & Johnson sts., Alexandria, La.
Winkelmann, John H.,
118 W. Lombard st., Baltimore, Md.
Winter, Jas. H.,
1375 Valencia st., San Francisco, Cal.
Wirth, Adam,
618 St. Charles st., New Orleans, La.
Wirthman, J. George,
1535 Grand ave., Kansas City, Mo.
Wirthman, Joseph C.,
18th st. & Troost av., Kansas City, Mo.
Wittich, Matthew H.,
1519E.Franklin ave.,Minneapolis,Minn.
Witting, Frederick F.,
Longmont, Colo.
Wittmer, Joseph W.,
1347 Clay st., Dubuque, Ia.
Woehner, Frederick A.,
Drawer V, Great Falls, Mont.
Wolf, Charles A.,
Broadway & Bank sts., Baltimore, Md.
Wolf, J. Carlton,
2207 E. Pratt st., Baltimore, Md.
Wolf, Michael F.,
Eastern av. & Chester st., Balto., Md.
Wolff, Daniel O.,
278 Dartmouth st., Boston, Mass.
Wolff, Edward H.,
522 Washington ave., St. Louis, Mo.
Woltereck, Gustav,
628 E. Eager st., Baltimore, Md.
Woltersdorf, Louis,
171 Blue Island ave., Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, Horatio C., Jr.,
3942 Walnut st., Philadelphia, Pa.
Wood, James P.,
2 Church st., New Haven, Conn.

Wood, John W.,
494 Broadway, Newport, R. I.
Woodhall, Frederick,
30 Park Place, Rockville, Conn.
Woodman, Walter I.,
217 Bellevue st., Newton, Mass.
Woodruff, Roderick S.,
92 Prospect st., Waterbury, Conn.
Woodworth, Benjamin S.,
1002 W. Wayne st., Fort Wayne, Ind.
Wooten, Thomas V.,
N. W. University Bldg., Chicago, Ill.
Wooyenaka, Keizo,
364 W. 173rd st., New York, N. Y.
Workman, Robert,
James st. & Broadway, Seattle, Wash.
Worth, Thomas R.,
Main st., Sebastopol, Cal.
Wrensch, Henry E., Jr.,
610 Bloomfield ave., Montclair, N. J.
Wright, Charles L.,
Allen&Dougherty sts.,WebbCity,Mo.
Wuensch, Charles,
494 Springfield ave., Newark, N. J.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
1415 Dryades st., New Orleans, La.
Wurdack, John H.,
1548 Wylie ave., Pittsburg, Pa.
Wyckhoff, Elmer E.,
246 E. 5th st., Brooklyn, N. Y.
Yellig, Daniel C.,
308 Summit st., Pittsburg, Pa.
Yeomans, Sidney C.,
3360 State st., Chicago, Ill.
Yorston, Matthew M.,
1063 Central ave., Cincinnati, O.
Young, David B.,
96 Lincoln ave., Bellevue, Pa.
Young, George O.,
Buckhannon, W. Va.
Young, Harry G.,
Residence Unknown.
Young, James J.,
Okolona, Ark.
Yunker, Charles H.,
Main st., Charleston, Ark.
Zabaldano, Alexander,
1201 Stockton st., San Francisco, Cal.
Zamora, Manuel,
162St.Sebastian st.,Quiapo,Manila,P.I.
Zane, Ralph R.,
803 Ashbury st., San Francisco, Cal.
Zeamer, Harry W.,
240 Locust st., Columbia, Pa.
Zeledon, Jose A.,
Limon, Costa Rica, C. A.
Zelinski, Walter F. von,
624 W. Adams st., Chicago, Ill.
Ziegler, Howard P.,
201 Windsor st., Reading, Pa.
Ziegler, Philip M.,
526 Penn st., Reading, Pa.
Zimmer, Harry E.,
132 E. Wash'ton st., Indianapolis, Ind.
Zinn, Chas. E.,
300 W. Ninth st., Kansas City, Mo.
Zoeller, Edward V.,
Main st., Tarboro, N. C.
Zottman, William H.,
1 Church st., Burlington, Vt.
Zuenkeler, J. Ferd.,
1902 Vine st., Cincinnati, O.
Zurawski, Narcys J.,
4800 Loomis st., Chicago, Ill.

LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF THE LAST REPORT.

	Residence.	Elected.
Anderson, John C.,	Denver, Colo.,	1908
Baas, George A.,	Batesville, Ind.,	1906
Banks, Walter C.,	Riverside, Cal.,	1907
Bevens, Joe L.,	Newport, Ark.,	1907
Blome, Walter H.,	Detroit, Mich.,	1903
Bohlsen, Henry C.,	Louisville, Ky.,	1908
Brand, Joseph H.,	Cincinnati, O.,	1904

Brown, Chas. M.,	Cleveland, O.,	1902
Campbell, Chas. B.,	Washington, D. C.,	1902
Collins, Albert N.,	Westerly, R. I.,	1882
Collins, Frank A.,	Akron, O.,	1906
Currier, Ralph A.,	Beverly, Mass.,	1908
Eichrodt, Mary E.,	Indianapolis, Ind.,	1906
Elgin, Lewis L.,	Hopkinsville, Ky.,	1907
Gidley, William F.,	Holly, Mich.,	1907
Green, Carl V.,	Chicago, Ill.,	1906
Gross, Charles E.,	Washington, D. C.,	1900
Harper, Chas. B.,	Akron, O.,	1904
Hook, James P.,	Hancock, Md.,	1905
Jackson, Samuel R.,	Hot Springs, Ark.,	1907
Johnson, Thur W.,	Chicago, Ill.,	1908
Jungk, Walter A.,	Chicago, Ill.,	1907
Katz, Gustave,	New Orleans, La.,	1903
Knox, Steven D.,	Little Rock, Ark.,	1907
Lindley, Ira W.,	Central City, Neb.,	1908
McCracken, Oscar V.,	Oakland, Cal.,	1908
Meyer, Walter F.,	Colorado City, Colo.,	1908
Mrazek, Leo L.,	Chicago, Ill.,	1906
Potter, Henry E.,	Paragould, Ark.,	1907
Potts, David G.,	Philadelphia, Pa.,	1893
Price, Chas. H.,	Salem, Mass.,	1882
Price, Joseph,	Salem, Mass.,	1888
Queeny, John F.,	St. Louis, Mo.,	1905
Reese, David J.,	Philadelphia, Pa.,	1906
Remington, J. Percy,	Philadelphia, Pa.,	1901
Ringer, Chas. E.,	Pittsburg, Pa.,	1905
Ritter, Clyde,	Angola, Ind.,	1905
Schmidt, F. Joseph,	Chicago, Ill.,	1906
Schmidt, Walter K.,	Grand Rapids, Mich.,	1903
Schreiber, August,	Tell City, Ind.,	1901
Slater, Frank H.,	Matawan, N. J.,	1882
Snow, Herbert W.,	Chicago, Ill.,	1906
Snow, Levi M.,	Fairhaven, Mass.,	1905
Sprague, John F.,	Raleigh, N. C.,	1908
Stott, Samuel T.,	Washington, D. C.,	1900
Tepe, Louis,	Evansville, Ind.,	1907
Tesche, Adolph G.,	Mendota, Ill.,	1908
Thornburgh, Thomas R.,	Indianapolis, Ind.,	1908
Tobin, John M.,	Narragansett Pier, R. I.,	1887
Toplis, William G.,	Philadelphia, Pa.,	1905
Torbert, Willard H.,	Dubuque, Ia.,	1887
Treasure, John T.,	Salt Lake City, Utah,	1908
Trout, John H.,	Los Angeles, Cal.,	1907
Valentine, William G.,	Chicago, Ill.,	1905
Voegeli, Thomas,	Minneapolis, Minn.,	1905
Wassmann, Louis W.,	Louisville, Ky.,	1907
Webber, Arthur H.,	Cadillac, Mich.,	1903
White, Simeon L.,	Houlton, Me.,	1908
Wolf, Frank C.,	Los Angeles, Cal.,	1907
Wulzen, Dietrich H.,	San Francisco, Cal.,	1907

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF THE LAST REPORT.

	Residence.	Elected.
Berryhill, Henry P.,	Connelsville, Pa.,	1890
Buntin, William C.,	Terre Haute, Ind.,	1906
Castelhun, Karl,	Newburyport, Mass.,	1902
Dougherty, Samuel E.,	Linden, N. J	1875
Drake, John R.,	Milwaukee, Wis.,	1860
Duckett, Walter G.,	Washington, D. C.,	1876
Eckert, John,	Newark, N. J.,	1902
Fieber, Gustavus A.,	Cincinnati, O.,	1893
Fischer, Henry,	St. Louis, Mo.,	1901
Gaus, Chas. H.,	Albany, N. Y.,	1879
Gordon, William J. M.,	Cincinnati, O.,	1854
Hancock, Chas. W.,	Langhorne, Pa.,	1868
Harlow, Noah S.,	Bangor, Me.,	1859
Harrison, William J.,	Lakewood, N. J.,	1896
Kent, Henry A.,	Elizabeth, N. J.,	1880
Kline, Mahlon N.,	Philadelphia, Pa.,	1878
Lawrence, Henry H.,	Philadelphia, Pa.,	1907
Moore, Joachim B.,	Philadelphia, Pa.,	1860
Owens, Richard J.,	Brooklyn, N. Y.,	1860
Rano, Chas. O.,	Buffalo, N. Y.,	1866
Redsecker, Jacob H.,	Lebanon, Pa.,	1881
Schubert, John J.,	Kankakee, Ill.,	1907
Scott, William H.,	Richmond, Va.,	1873
Searby, William M.,	San Francisco, Cal.,	1882
Sharp, Alpheus P.,	Baltimore, Md.,	1855
Simmons, Frank B.,	Woonsocket, R. I.,	1897
Simms, Giles G. C.,	Washington, D. C.,	1860
Spangler, Newton L.,	Guthrie, Okla..	1906
Stein, Jacob H.,	Reading, Pa.,	1902
Steinmeyer, William O.,	Carlinville, Ill.,	1901
Stoughton, Dwight G.,	Hartford, Conn.,	1890
Wiegand, Thomas S.,	Philadelphia, Pa.,	1857
Williams, Richard W.,	Three Rivers, Can.,	1883
Woodworth, Chas. B.,	Fort Wayne, Ind.,	1900

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES ACCORDING TO ARTICLE III, CHAPTER VIII, OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE ADOPTED AT MONTREAL, CANADA, AUGUST, 1896. SEE PAGE 17, VOL. 44, PROCEEDINGS).

Name.	Residence.	Elected.
Ahlborn, F. A.,	Chicago, Ill.,	1906
Alexander, C. E.,	Washington, D. C.,	1899
Askew, A. J.,	Cotabato, Mindanao, P. I.,	1905
Barton, W. M.,	Residence Unknown,	1906
Bailey, Wm. E.,	Carnegie, Okla.,	1906
Bell, R. N.,	Philadelphia, Pa.,	1905
Biggs, Warren H.,	Williamstown, N. C.,	1905

Blaikie, Wm.,	Utica, N. Y.,	1879
Bond, J. N.,	Mt. Vernon, Ill.,	1902
Bonta, C. LaRue,	Philadelphia, Pa.,	1906
Brickman, A. O.,	Baltimore, Md.,	1898
Brown, J. C.,	Colorado Springs, Colo.,	1905
Bunnell, Lynn L.,	Norwood, Ohio,	1906
Cameron, Charles S.,	Philadelphia, Pa.,	1906
Campbell, Geo. S.,	Milburn, N. J.,	1905
Case, George E.,	Princeton, Ill.,	1906
Castillon, L. A.,	New Orleans, La.,	1904
Chamberlin, Wm. A.,	Collingswood, N. J.,	1906
Chisholm, J. C.,	Dallas, Texas,	1906
Clark, Arthur B.,	Shawnee, Okla.,	1906
Cochran, Wm. M.,	Harrisville, Pa.,	1906
Collins, John L.,	Residence Unknown.	1906
Collins, John S.,	Chicago, Ill.,	1906
Compton, Paul,	Fort Crook, Neb.,	1906
Covington, S. M.,	Summitt, Miss.,	1906
Crawford, C. M.,	Seattle, Wash.,	1906
Crawford, F. E.,	Providence, R. I.,	1902
Crook, F. R.,	Ripley, Ohio,	1905
Crouch, W. T.,	Blue Fields, W. Va.,	1906
Cutler, B. C.,	Worcester, Mass.,	1905
von Danden, R. A.,	Chicago, Ill.,	1906
Donaberger, S. B.,	Chicago, Ill.,	1906
Drew, Walter I.,	Portland, Me.,	1896
Eberly, F. H.,	Philadelphia, Pa.,	1907
Elliott, Boyce,	N. Y. City, N. Y.,	1906
Erck, Philip F.,	Springfield, Mass.,	1906
Finney, J. J.,	Philadelphia, Pa.,	1906
Gamer, A. C. C.,	Tacoma, Wash.,	1902
Gape, Arthur G.,	Chardon, Ohio,	1904
Gauthier, C. D.,	Antigo, Wis.,	1906
Gibson, R. H.,	New Orleans, La.,	1906
Ginocchio, James A.,	Little Rock, Ark.,	1906
Gordon, F. T.,	Washington, D. C.,	1900
Graham, C. R.,	Brownsville, Pa.,	1906
Green, James B.,	Plumville, Pa.,	1905
Haeseler, F. P.,	Chicago, Ill.,	1906
Hall, Guy P.,	Wilkinsburg, Pa.,	1905
Hansen, N. P.,	Kearney, Neb.,	1906
Hantz, Charles N.,	Homestead, Pa.,	1906
Hargreaves, John,	Toronto, Ont., Canada,	1904
Harrison, W. H.,	Chicago, Ill.,	1905
Harson, Harry,	N. Y. City, N. Y.,	1906
Hinton, R. G.,	Philadelphia, Pa.,	1905
Howell, P. C.,	Washington, D. C.,	1906
Johnston, George P.,	Lexington, Okla.,	1905
Jones, Wm. D.,	Jacksonville, Fla.,	1903
Justice, J. E.,	Nashville, Tenn.,	1906
Kasper, A. T.,	Chicago, Ill.,	1906
Keaney, James J.,	Malden, Mass.	1899

Kelley, John J.,	Philadelphia, Pa.,	1905
Kornmann, Henry,	Baltimore, Md.,	1899
Krizan, Wm.,	Chicago, Ill.,	1906
Lachance, Seraphin,	Montreal, Can.,	1888
Lambert, Richard J.,	Residence Unknown,	1906
Lawrence, Geo. W.,	Residence Unknown,	1906
Lloyd, S. L.,	Inverness, Fla.,	1906
Lippy, George H.,	Residence Unknown,	1906
Luve, F. A. A.,	Ft. Sheridan, Ill.,	1902
Lowry, George W.,	Colton, S. D.,	1906
Mackey, J. C.,	Paterson, N. J.,	1905
Magruder, C. G.,	New Orleans, La.,	1904
Mariamson, Max,	N. Y. City, N. Y.,	1902
Martin, F. W.,	Residence Unknown,	1906
Matousek, J. T.,	Cleveland, Ohio,	1905
Maxwell, C. C.,	Arlington, S. D.,	1906
McClure, U. G.,	Chicago, Ill.,	1906
McCombie, James N.,	Boston, Mass.,	1906
McDonald, W. D.,	Cleveland, Ohio,	1905
McLarty, C.,	Yokohama, Japan,	1898
Meadows, A. W.,	Hot Springs, Ark.,	1907
Mentzer, H. H.,	Germantown, Philadelphia, Pa.,	1902
Mercer, Wm. E.,	Liberty, Ill.,	1902
Morgan, Thomas, Jr.,	Webb City, Mo.,	1905
Nie, Henry J.,	Kansas City, Mo.,	1905
Paine, E. F.,	Key West, Fla.,	1906
Perry, C. H.,	Zamboanza, P. I.,	1906
Porter, G. M.,	Chicago, Ill.,	1906
Pelz, C. T.,	Evansville, Ind.,	1907
Quin, Frank W.,	Pineville, La.,	1902
Rice, Ivan S.,	Pocatello, Idaho,	1906
Richard, V. B.,	Jennings, La.,	1905
Ridgway, Wm. F.,	Atlantic City, N. J.,	1902
Robinson, H. S.,	Colliers, W. Va.,	1905
Roll, Tod B.,	Hamilton, Ohio,	1906
Rosenthal, J.,	Chicago, Ill.,	1906
Rozanski, Boleslaus J.,	Chicago, Ill.,	1906
Runkel, Julia,	Residence Unknown,	1905
Sarradet, Atal A.,	Donaldsonville, La.,	1905
Scallin, Stephen H.,	Mitchell, S. D.,	1906
Schweitzer, Joseph,	Chicago, Ill.,	1906
Shaw, Frederick C.,	Denver, Colo.,	1908
Shoults, Robert G.,	Napa, Cal.,	1901
Smith, Owen C.,	Baltimore, Md.,	1906
Smith, R. H.,	Chicago, Ill.,	1906
Stuchlik, John,	Chicago, Ill.,	1906
Swain, Harry,	Philadelphia, Pa.,	1902
Thompson, E. T.,	Sioux City, Ia.,	1902
Treadwell, Wm. P.,	Dallas, Texas,	1906
Van Sickle, George C.,	Residence Unknown,	1906
Vause, H. Russell,	Chicago, Ill.,	1906
Veaco, S. H.,	East Chicago, Ind.,	1906

Walsdorf, Charles A.,	New Orleans, La.,	1904
Weber, Eugene,	Washington Barracks, D. C.,	1906
Weil, A. J.,	New Orleans, La.,	1905
Weiser, Wm. A.,	South Bend, Ind.,	1904
Weydell, K. Albus,	Chicago, Ill.,	1906
Wilser, J. M. S.,	Fargo, N. D.,	1906
Wolff, Gustave,	N. Y. City, N. Y.,	1903
Woodward, Albert A.,	Aberdeen, S. D.,	1906
Zamentowsky, David,	Chicago, Ill.,	1906
Zuber, A. E.,	Chicago, Ill.,	1906

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